

NATIONAL SERVICE MANUAL

1946-47 DATA



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SAN FRANCISCO, CALIFORNIA

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HOOD LOCK: Hood hinged at both sides and may be lifted from either side. To raise hood, press in on forward end of hood fastener handle (on side to be lifted), pull out on rear end of handle to release catch, lift hood up (hood pivots on hinge on opposite side). **NOTE**—To remove hood, release hood fastener handle on both sides and lift hood off.

MODEL IDENTIFICATION

SERIAL NUMBER: First No. All Series 1-4364445 (Flint), 2-4380001 (Southgate, Calif.), 3-4390001 (Linden, N. J.). Stamped on plate on right side of cowl under hood. **NOTE**—First digit of number indicates plant at which car built as noted above.

ENGINE NUMBER: First No. 4558037-4 (40), 4558037-5 (50), 4558297-7 (70). Stamped on boss on right side of crankcase below pushrod cover. Suffix letter indicates model as noted above.

TUNE-UP

COMPRESSION: Ratio—6.3-1 (40, 50), 6.6-1 (70). Pressure—112 lbs. (40, 50), 114 lbs. (70) at cranking speed.

VACUUM READING: Steady 18-20" idling at 8 MPH.

FIRING ORDER: 1-6-2-5-8-3-7-4.

SPARK PLUGS: AC No. 48. 14 mm. Metric.

Gaps—.025. Limits .023-.028".

IGNITION: See Coil, Condenser, and Distributor.

Breaker Gap—.015". Cam Angle 31° (closed).

Breaker Arm Spring Tension—19-23 ozs.

Rotation—Counter-clockwise viewed from above.

Automatic Advance—Starts 250 RPM. 7° at 400 RPM. Max. 13° at 1500 RPM (Distr. & RPM.).

Vacuum Advance—Starts with 5-7" of HG. Max. 5-6° (Distr. degrees) with 10-13" of HG.

IGNITION TIMING: Std. Setting—4° BTDC (40, 50), 6° BTDC (70) for fuel of 72-74 Octane Rating (40, 50), 78-80 Octane Rating (70).

Timing Mark—Flywheel mark "ADV" at indicator in inspection hole in right front face of housing above starter. Mark is a knurled and painted section on flywheel. Set ignition at leading edge of mark.

Final Ignition Setting—Loosen mounting screws, rotate distributor to give slight "ping" when accelerating between 10-20 MPH with wide open throttle.

CARBURETION: See Carburetion.

Idle Setting—Both idle screws approximately 1 turn (½-1) turn open and set for smooth idle (turn screws out for richer mixture). Idle speed 8 MPH. or 450 RPM.

Float Level (Carter Carb.)—3/16" top of each float to gasket seat on cover with valve seated (invert to check). Fuel level even with bottom of inspection hole on side of float bowl with engine idling.

Float Level (Stromberg Carb.)—Fuel level 19/32" below top edge of float bowl or even with bottom of inspection hole on side of bowl, engine idling.

Accelerating Pump (Carter Carb.)—Not adjustable.

Accelerating Pump (Stromberg Carb.)—Center hole (med. stroke) normal for all-seasonal operation.

Fuel Pump Pressure: 4¾ lbs. maximum.

MANIFOLD HEAT CONTROL: Thermostatic coil type.

Setting—Thermostatic coil wind-up should be ½ turn (¼" wide thermostat), ¼ turn (¾" wide thermostat) at 70°F. Adjust counterweight spring clip so that edge of counterweight is approximately 7/16" past vertical center line of pivot with valve closed (pin must prevent valve striking body when closed or open).

VALVES: See Valve Timing.

Tappet Clearance—.015" All Valves with oil and water temperatures stabilized. See stabilizing (warming up) procedure under Valve Timing.

STARTING: See Battery, Starter, Generator, Regulator.

IGNITION

COIL: Delco-Remy No. 1115026 (with Radio Condenser in coil case). Mounted on engine side of dash.

Ignition Current—2½ amperes idling, 4½ stopped.

CONDENSER: Delco-Remy Part No. 1869704.

Capacity—.18-.25 microfarad.

DISTRIBUTOR: Delco-Remy No. 1110801. Single breaker, 8 lobe cam type with full automatic advance, auxiliary vacuum spark control and manual adjustment (slotted mounting screw holes).

See Tune-Up data for distributor specifications.

IMPORTANT SERVICE NOTE—Some distributors on early cars did not have sufficient grease or facilities for greasing. These distributors (and distributors with frozen bearings) should be replaced (replaced by manufacturer under warranty). Distributors on which drive gear pin has sheared should be repaired by installing new pin, No. 822273, with sufficient number of No. 1848595 and No. 184-8596 washers for correct shaft endplay of .002-.007".

IGNITION TIMING: See Tune-Up for settings.

CARBURETION

CARBURETOR: Stromberg or Carter. 1" (40, 50), 1¼" (70) Dual (double barrel) downdraft types.

	Carter Model	Stromberg Model
40, 50	WCD 608-S	AAV-16 Code 7-66
70	WCD 609-S	AAV-26 Code 7-57

See Tune-Up data for carburetor adjustment directions.

Metering Rods & Jets (Carter)—As follows:

Carb.	Metering Jet	Std. Metering Rod & Gauge
608-S.....120-65S (.082")	75-459 (T109-152-2.440")	
609-S.....120-65S (.082")	75-592 (T109-163-2.940")	

Metering Jets (Stromberg)—Std. main metering jet No. P-24473—.045" (40, 50), P-24673—.051" (70).

FAST IDLE: Linked to automatic choke.

Setting (Carter)—Adjust fast idle screw on the throttle shaft lever for .012" (608-S), .018" (609-S) throttle opening with choke valve tightly closed and screw on "high" step of fast idle cam.

NOTE—Clearance between the fast idle cam arm and boss on casting must be .020" in this position, adjust by changing position of connector rod lever on choke valve shaft.

Setting (Stromberg)—Close choke valve on #53 (.0595") drill rod, adjust by bending fast idle cam rod so that locking lever on throttle valve shaft just clears loose lever on fast idle cam stud as throttle is opened and closed.

AUTOMATIC CHOKE: On carburetor. Carter type is "Climatic Control."

Setting (Carter)—Centered (index mark on cover centered on reference mark on housing).

Setting (Stromberg)—"V" mark on cover in line with reference mark (projection) on cover.

FUEL PUMP: AC Type AJ. Diaphragm type combination fuel and vacuum pump. Pump Exchange No. 529 (40, 50), 530 (70). Pressure 4¾ lbs. (4-5¼).

AIR CLEANER: AC. Heavy Duty Oil-bath type.

Servicing—Clean and refill with 1 pint SAE No. 50 engine oil at 5000 mile intervals. **NOTE**—Clean the gauze in Oil Filler Cap & Crankcase Filter Inlet with kerosene when air filter serviced.

ELECTRICAL

BATTERY: Delco Type 15E2-W (40, 50), 17E2-W (70). 15 plate, 100 A.H. Capacity at 20 hr. rate (15E2-W), 17 plate, 120 A.H. Capacity at 20 hr. rate (17E2-W).

Grounded Terminal—Negative (—) to engine block.

Location—Under engine hood on right side.

STARTER: Delco-Remy 1107049 (40, 50 Std.), 1107057 (40, 50 RHD), 1107929 (70 Std.), 1107935 (70 RHD).

Armature 1867897 (1107049, 57), 820158 (1107929, 35).

IMPORTANT SERVICE NOTE—If clutch pinion does not engage with flywheel (on starters built before August 1, 1946), replace Shift Lever, Part No. 1884808, with redesigned part of same number which may be identified by zinc-plated finish (original lever painted black) which will correct interference between shift lever and collar. **NOTE**—Starters on which this correction has been made may be identified by spot of white paint on frame above name plate and by zinc-plated finish of lever. Starters built after Aug. 1, 1946 (Serial No. 6-H-1 up) have this new lever.

If Starter does not engage or cranks continuously (with new type Shift Lever described above)—Check for binding of solenoid contact disc and pushrod on terminal plate guide pin. Replace contact disc and pushrod assembly if guide hole is eccentric (replaced by manufacturer under warranty), straighten guide pin if bent.

Drive—Overrunning clutch (solenoid pinion shift).

Rotation—Counter-clockwise at commutator end.

Brush Spring Tension—24-28 ozs.

Cranking Engine—40, 50) 90 RPM, 150 amperes, 4.5 volts; (70) 90 RPM, 175 amperes, 5 volts.

Performance Data—1107049

Torque	R.P.M.	Volts	Amperes
0 ft. lbs.	5500	5.0	65
12 "	Lock	3.37	525

Performance Data—1107929

Torque	R.P.M.	Volts	Amperes
0 ft. lbs.	5500	5.67	65
16 "	Lock	3.0	600

Vacuum Switch:—Delco-Remy No. 1990127 (Stromberg Carburetor), Carter Car Starter No. 192-11U (Carter). Mounted on the carburetor.

Setting—Same as for 1942 type. See article in Electrical Equipment Section on these units.

C NTINUED ON NEXT PAGE

C N T I N U E D F R M P R E C E D I N G P A G E

GENERATOR: Delco-Remy 1102679 (40, 50), 1102668 (70). Two brush (shunt) type with vibrating voltage and current regulation. Ventilated by fan.

NOTE—Generators interchangeable if correct pulley used. Pulley Diameter & Groove Width 3 13/32"–1 1/16" (40, 50), 3 17/32"–1 5/16" (70).

Armature No.—1877806 (all models).

Maximum Output—32-34 amperes (regulator setting), 8.0 volts, 2400 RPM or 25 MPH.

Performance Data

	Amperes	Volts	RPM
Cold	30	8.0	1825

Rotation—Counter-clockwise at commutator end.

Brush Spring Tension—25 ozs.

Field Current—1.67-1.82 amperes at 6.0 volts.

Belt Adjustment—1/2" belt deflection at center.

REGULATOR: Delco-Remy 1118201. Single Core Type.

Relay Closes—6.2-6.7 volts hot. Opens 0-4 amps.

Voltage Setting—7.2-7.4 volts hot (operating temp.).

Current Setting—32-34 amperes (hot).

Checking & Adjusting—See article in Electrical Equipment Section on this unit.

LIGHTING: Headlamps—Sealed Beam type.

Adjustment—Aim upper beam straight ahead (hot spot center 3" below lamp center height at 25').

Lamp Bulbs—See Specification Table on Page 31.

THERMOSTATIC RELAY: Delco-Remy. On lighting switch. Contacts remain closed with 30 amperes, open in 3 minutes with 42 amperes at 70°F.

FUSES: Clock—2 ampere, SFE. In clock lead.

Instr. & Clock Lights—14 amp., SFE. On switch.

Direction Signal—14 amp., SFE. In flasher lead.

Cigar Lighter (Front)—15 amp., 1AG. In lighter.

Cigar Lighter (Rear) & Dome Light (50, 70)—30 ampere. In connector back of instrument panel.

Conv. Top Control—9 ampere SFE. On switch.

ENGINE

ENGINE SPECIFICATIONS: Eight cylinder, In line, "I" (valve-in-head) type.

Bore & Stroke (40, 50)—3 3/32"x 4 1/8".

Bore & Stroke (70)—3 7/16"x 4 5/16".

Displacement—248 cu.ins. (40, 50), 320.2 (70).

Rated Horsepower—30.63 (40, 50), 37.-81 (70).

Developed Horsepower—110 at 3600 RPM (40, 50), 144 at 3600 RPM (70).

Compression Ratio—6.3-1 (40, 50), 6.6-1 (70).

CYLINDER HEAD & GASKET NOTE: 1946 Engine block has larger water openings at No. 8 cylinder and no holes between this point and No. 1 cylinder (vent only at No. 1). 1946 type Cylinder Head & Gasket have larger water passages for use with this block. **CAUTION—Do not use earlier type Cylinder Heads or Gaskets on 1946 engine (will cause overheating).** NOTE—1946 type Cylinder Head and Gasket can be used on earlier type engines.

PISTONS: New Aluminum Alloy type with oxide finish, Turbulator Top, Cam ground type with transverse slot. Length 4 21/64" (40, 50), 4 9/16" (70). Weight—13.776 ozs. (40, 50), 17.94 ozs. (70).

Removal—Pistons and rods removed from above.

Clearance (40, 50)—.0021" (top), .00185" (bottom) of skirt. Check clearance with 1/2" feeler gauge stock. .0015" feeler and should hold own weight on .002" feeler with piston and block at 70°F (cylinder wall clean and dry).

Clearance (70)—.0023" (top of skirt), .0020" (bottom of skirt). Check piston fit with .0015" and .002" feelers as directed for 40, 50 (above).

Replacement Pistons—Furnished Std. and .005", .010", .020", .030" Oversize. NOTE—1946 pistons lighter than 1942 type (will be furnished for use on 1942 engines) and should not be mixed with 1942 type heavier pistons.

CAUTION—Do not install 1942 type heavier pistons in 1946 engines (will affect engine balance).

Pistons may be identified by casting number (inside piston) as follows:

Series	Size	1942 Heavy Type	1946 Light Type
40, 50.....Std., .005", .010" OS.....		1324716.....	1314308
40, 50......015", .020", .030" OS.....		1324725.....	1319789
70.....Std., .005", .010" OS.....		1324717.....	1315710
70......015", .020", .030" OS.....		1324731.....	1319796

Installation—Hollowed side of head to camshaft.

PISTON RINGS: Width End Gap Side Clearance
Compression3/32"......010-.020"......0015-.0035"
Oil Control3/16"......010-.020"......0015-.003"

Installation Note—Install taper faced compression rings with mark "TOP" upward (top ring inner diameter groove upward).

Replacement Rings—Furnished Std. and .010", .020", .030" Oversize. Use .010" OS. ring for .005" OS. piston.

PISTON PIN: Clamped in rod. Clearance .0003-.0004". In piston (easy finger push fit at 70°F).

Replacement Pins—Fitted and furnished with pistons.

CONNECTING ROD BEARINGS: Spun babbitt-lined type with solid shims.

Clearance—.0008-.0018". Sideplay—.005-.010".

Replacement Bearings—Install replacement rods.

Rod Installation—Marks on rods and caps toward rear of engine. Oil hole in rod toward camshaft.

CRANKSHAFT BEARINGS: Steel-backed "Durex", slip-in type with solid shims.

Clearance—.0007-.0025" Endplay .004-.008" (#3).

Replacement Bearings—Finished (reamed to size) bearings furnished in complete sets only. Unfinished bearings (must be reamed to size) also furnished.

CAMSHAFT SETTING: Mesh copper-plated washers on chain (10 links apart) with sprocket marks upward.

VALVES:	Head Diam.	Seat Angle	Stem Clearance
40, 50 Int.....1 17/32".....	45°		.0015-.0035"
40, 50 Exh.....1 11/32".....	45°		.0021-.0039"
70 Intake.....1 25/32".....	45°		.0015-.0035"
70 Exhaust 1 7/16".....	45°		.0021-.0039"

Valve Spring Pressure: Spring free length 1 29/32" (inner spring), 2 11/32" (outer spring).

All Series—	Inner Spring	Outer Spring
Closed	20 lbs. at 1 21/32".....	32 lbs. at 1 15/16"
Open	51 lbs. at 1 5/16".....	77 lbs. at 1 19/32"

VALVE TIMING

Tappet Clearance:—.015"—all valves—engine hot.

IMPORTANT NOTE—This .015" setting is operating clearance with oil & water temperatures stabilized and is secured as follows: Run engine in shop at fast idle (700 RPM. min.) for 20 minutes min., 30 minutes max., then adjust tappets using .017" feeler as 'Go', .018" feeler 'No Go' (if car has been run previously and engine oil is warm when shop warming up run started), or use .018" feeler as 'Go', .019" feeler 'No Go' (if car not run previously and engine and oil are cold or at room temperature when shop warming up run started). **CAUTION—Cars brought in from a hard run should be allowed to stand for 1 hour before tappet adjustment is made. Cars which have stood outside in cold weather should be warmed up for 30 minutes min. (shop run at fast idle) and then set tappet clearance .018" feeler 'Go', .019" 'No Go'.**

Valve Timing: The #2 or #7 exhaust valve should be .145" open (Series 40, 50), .155" open (70) with #1 & 8 pistons at TDC. with flywheel mark 'U.D.C./1-8' at indicator hole above starter (use dial indicator on valve spring cap to check opening).

LUBRICATION & COOLING

LUBRICATION:	Crankcase Cap (Dry)	(Refill)
40, 50	6 1/2 qts.....	5 1/2 qts.
70	8 qts.....	7 qts.

Normal Oil Pressure—45 lbs. at 35 MPH.

COOLING:	Capacity (Without Heater)	(With Heater)
40, 50	13 qts.....	14 1/4 qts.
70	16 3/4 qts.....	18 qts.

Pressure Valve—In filler cap. Opens at 7 lbs.

Thermostat—In outlet elbow on cylinder head. By-pass type. Starts to open at 152°F.

MECHANICAL

CLUTCH: Own Make. Single plate "Crown Spring" on 40, 50 only. Driven Member Borg & Beck 'Borg-lite' or Long type. **NOTE—Driven Member must be installed with oil baffle toward pressure plate.**

Pedal Adjustment—3/4-1" free travel. Adjust screw on connector link at clutch fork.

Facings—Woven type. I. D. 6" (40, 50), 6 1/2" (70), O. D. 10" (40, 50), 10 1/2" (70). Thickness .125" (all).

FRONT SUSPENSION: Independent parallelogram type with coil springs. *See Specification Table Page 38.*

BRAKES: Bendix Hydraulic "No Eccentric" type. Parking brake pedal (Step-on type) applies rear service brakes.

Clearance—.015" at both ends of secondary (rear) shoe with primary shoe forced out against drum.

Drum Diameter—12" (All Series).

Lining—Moulded type (all shoes). Width 1 3/4" (40, 50), 2 1/4" (70), Thickness 3/16". Length per wheel 23 1/16".

HOOD LOCK: Hood is Alligator type hinged at cowl. To raise hood, press back on radiator ornament to free manual and safety catches, lift hood up.

MODEL IDENTIFICATION

SERIAL & ENGINE NUMBER: Stamped on right front of crankcase above water pump and on right frame side member to rear of engine support bracket.

Series	Wheelbase	First Serial No.
1946-60S	133"	6,400,001
1946-61	126"	5,400,001
1946-62	129"	8,400,001
1946-75	136"	3,400,001
1946-75 Comm'l	163"	3,400,001

TUNE-UP

COMPRESSION: Pressure—100-105 lbs. at cranking speed (7.25-1 Std. Cast iron head).

VACUUM READING: Steady 20-21" idling at 7-8 MPH.

FIRING ORDER: 1-8-7-3-6-5-4-2 (Cyl. Nos. 1-3-5-7 Left Bank, 2-4-6-8 Right Bank, front-to-rear).

SPARK PLUGS: AC No. 104. 10 mm. Metric type.

Gaps—.030" Limits .028-.033".

NOTE: Tighten plugs just enough for good gasket seal (7-10 ft. lbs.).

IGNITION See Coil, Condenser, and Distributor.

Breaker Gap:—.015" Limits .0125-.0175".

Cam Angle:—31° closed (with .015" gap).

Breaker Arm Spring Tension:—19-23 ozs.

Rotation:—Clockwise viewed from above.

Automatic Advance:—Starts 500 RPM. Max. 12° at 2000 RPM. (Distr. degrees and RPM.).

Vacuum Advance:—Starts with 5.5-7.5" of HG. Max. 9° (distr. degrees) with 15-18" of HG.

IGNITION TIMING: Std. Setting—5° BTDC.

Timing Mark:—'IG/A' on timing disc behind crankshaft pulley lined up with pointer on chain case.

Manual Adjustment Setting:—Set for slight ping accelerating with wide throttle below 15 MPH.

CARBURETION: See Carburetion.

Idle Setting:—With engine warm (choke valve wide open, fast idle inoperative), set throttle stop screw for hot or slow idle speed of 7-8 MPH. (Std.), exactly 375 Eng. RPM. (Hydra-Matic Drive Cars). Adjust both idle screws for smooth idle (turn screws in for leaner mixture). Setting for Carter carburetors is ½-1½ turns open.

Float Level (Carter):—9/64" from top of each float to gasket seat on cover with valve seated (invert to check). Fuel level even with bottom of inspection plug hole on side of bowl with engine idling.

Float Level (Stromberg):—Fuel level 5/8" below top edge of bowl or even with bottom of inspection hole on side of bowl with engine idling.

Accelerating Pump (Carter):—No adjustment.

Accelerating Pump (Stromberg):—Inner hole Normal, outer hole (max. stroke) used when required.

Fuel Pump Pressure: 4¾ lbs. (3½-5) max.

VALVES: See Valve Timing.

Tappet Clearance:—None in service (automatic hydraulic type tappet take-up).

STARTING: See Battery, Starter, Generator, Regulator.

IGNITION

COIL: Delco-Remy No. 1115129. Mounted on dash. Ignition Current—2.2 amperes idling, 4.4 stopped.

CONDENSER: Delco-Remy Part No. 1869704. Capacity—.18-.25 microfarad.

DISTRIBUTOR: Delco-Remy No. 1110807. Full automatic advance type with auxiliary vacuum spark control and manual adjustment ("octane selector"). See *Tune-Up for distributor specifications*.

IGNITION TIMING: See *Tune-Up for settings*.

CARBURETION

CARBURETOR: Stromberg Model AAV-26 or Carter WCD Model 595-S. 1¼" dual (double barrel) down-draft type with Fast Idle and Automatic Choke. See *Tune-Up for carburetor adjustment directions*.

Metering Jets (Carter):—Metering Rod Jet 120-103S (.089"). Std. Metering Rod 75-576. Metering Rod Gauge No. T109-163 (2.940").

Metering Jets (Stromberg):—No. P-19442 (.048").

FAST IDLE: Linked to automatic choke.

Setting (Carter):—With choke valve tightly closed, adjust fast idle screw (on opposite end of throttle shaft from regular throttle stop screw) for .018" throttle opening (screw on high lobe of fast idle cam).

Setting Stromberg: Hold throttle stop screw against high lobe of fast idle cam, move choke valve toward closed position as far as possible, check choke valve opening. Adjust by bending fast idle connector rod so that choke valve opening is .116" (#32 drill).

AUTOMATIC CHOKE: On carburetor. Carter type is "Climatic Control."

Setting (All Models):—Index mark on cover centered on reference mark on housing.

FUEL PUMP: AC Type AX. Diaphragm type fuel-and-vacuum pump. Exchange No. 521. Pressure 4¾ lbs. (3½-5).

AIR CLEANER: AC oil-bath type.

Servicing:—Clean and refill with 1 pint SAE No. 50 engine oil at 2000 mile intervals or more often if required. **NOTE:**—Use SAE No. 40 oil in winter.

NOTE:—Clean filter element in oil filler cap when crankcase drained (2000 mile intervals).

ELECTRICAL

BATTERY: Delco Type 17K3W (exc. 75 Comm'l), 19Q3W (75 Comm'l). 6 volt, 17 plate, 115 Ampere Hour Capacity at 20 hr. rate (17K3W), 19 plate, 125 Ampere Hour Capacity at 20 hr. rate (19Q3W).

Grounded Terminal:—Negative (—) terminal.

CAUTION:—Grounded terminal now conforms to other General Motors cars and is reversed from 1942 Cadillac.

Location:—Under engine hood on outside of right frame side member.

STARTER: Delco-Remy No. 1107931. Armature 820158. **NOTE:**—Cars with Hydra-matic Drive have Neutral Switch in series with starter pushbutton so that starter operative only with transmission Selector Lever in neutral position.

Drive:—Solenoid pinion shift (overrunning clutch).

Brush Spring Tension:—24-28 ozs.

Rotation:—Counter-clockwise at commutator end.

Performance Data

Torque	R.P.M.	Volts	Amperes
0 ft. lbs.	5500	5.67	65
16 "	Lock	3.0	600

GENERATOR: Delco-Remy No. 1102693 (Std.), 1102694 (With Hydra-Matic Drive). Armature No. 1879002. Two brush (shunt) type with voltage and current regulation. **NOTE:**—Generators are alike except for drive pulleys (for different rear axle ratios) and are interchangeable. **Maximum Charging Rate:**—34-36 amperes, 8.0 volts, 27 MPH (both types).

Performance Data

Amperes	Volts	RPM.
30	8.0	1750

Rotation:—Counter-clockwise at commutator end.

Brush Spring Tension:—25 ozs.

Field Current:—1.67-1.82 amperes at 6.0 volts.

Belt Adjustment:—Loosen mounting bolts, raise generator (pivots on one bolt) until belt deflection midway between pulleys is ¾-1" with 16 lb. pressure. **NOTE:**—Fan belt is adjusted separately. Belts are new synthetic rubber type and must be adjusted exactly to specifications.

REGULATOR: Delco-Remy No. 1118242

Relay Closes:—6.2-6.7 volts. **Opens:** 0-4 amperes.

Voltage Setting:—7.2-7.4 volts hot (operating temp.).

Current Setting:—32-34 amperes hot.

Checking & Adjusting:—See article in *Electrical Equipment Section on this unit*.

LIGHTING: Headlamps—Guide Sealed Beam type.

Adjustment:—Aim upper beam straight ahead (hot spot center 3" below lamp center height at 25').

Lamp Bulbs:—See *Specification Table on Page 31*.

THERMOSTATIC RELAY: Delco-Remy. On lighting switch. Contacts remain closed with 30 amperes, open in 3 minutes with 42 amperes at 70°F.

ENGINE

ENGINE SPECIFICATIONS: 8 Cylinder, 90° Vee, "L" Head type. Both cylinder blocks and upper crankcase cast Enbloc.

Bore:—3½". **Stroke:**—4½".

Displacement:—346 cu.ins. **Rated HP:**—39.20.

Developed Horsepower:—150 at 3400 RPM.

Compression Ratio:—7.25-1 Std. Cast iron head.

PISTONS: New three-ring, aluminum alloy, Cam-ground, T-slot type with Anodized finish.

Length:—4⅞".

Weight:—1.197 lbs. (stripped), 1.593 lbs. (complete).

Removal:—Pistons and rods removed from above.

Clearance:—.0020-.0022" measured ⅛" below upper cross-slot at right angles to pin with piston at 70°F.

Fit pistons in same manner as on 1941-42 cars (clearances same as for 1941). See *Cadillac Special Shop Notes in manual or 1942 Supplement*.

Replacement Pistons:—Furnished Std. (3.4979-3.4999"), and .010" (3.5089-3.5099"), .020" (3.5189-3.5199"), .030" (3.5289-3.5299") Oversize.

Installing Pistons:—T-slot to left (all pistons).

PISTON RINGS: Width End Gap Side Clearance
Compr. (#1, 2)5/64".....007-.023".....0022-.0035"
Oil Cont. (#3)3/16".....007-.023".....0013-.0026"
Installation Note:—Install compression rings with notched inner edge upward.

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Replacement Rings—Furnished Std. and .010", .020", .030" Oversize.

PISTON PIN: Floating type (lock ring each end). Clearance—.00005-.0001" or free hand-press fit at 70° in piston, .0002-.0008" in rod.

CONNECTING ROD BEARINGS: Removable, steel-backed, Moraine Durex 300 lined type. No shims. Clearance—.0005-.002" (new), .0045" (worn limit). Sideplay—.008-.014".

Rod Installation—Numbers on rods and bearing caps on same side and pointing down toward oil pan.

CRANKSHAFT BEARINGS: Removable, steel-backed, Moraine Durex 300 lined type. No shims.

Clearance—.0008-.0025" (new), .005" (worn limit). Endplay—.001-.005" (new), .010" (worn limit). Adjust by replacing center (#2) bearing.

CAMSHAFT SETTING: Mesh chain with sprockets turned so that "O" marks are adjacent and in line with a straight edge across the shaft centers.

VALVES: Head Diam. Seat Angle Stem Clearance
Intake1.876-1.886"45°0005-.0025"①
Exhaust1.626-1.636"45°0015-.0035"①
①—Worn limit .005".

Valve Spring Pressure—60-67 lbs. at 1 59/64" (closed), 139.5-150.5 lbs. at 1 37/64" (open). Free length 2.210"

VALVE TIMING

Valve Timing Check—No. 1 intake valve opens with piston at TDC with mark "C.1/6" behind crankshaft pulley in line with point on chain case cover.

NOTE—Valve Lifters are Wilcox-Rich "Zero-lash" type (hydraulic tappet take-up). Clearance between lifter and valve stem with hydraulic unit compressed must be .030-.070".

LUBRICATION & COOLING

LUBRICATION: Crankcase Capacity—7 qts.

Normal Oil Pressure—25 lbs. at 30 MPH.

COOLING: Capacity—25 quarts.

Pressure Valve—In filler cap. Opens at 8 1/4-9 1/4 lbs. **Thermostat**—Dole. Blocking type in radiator inlet casting at radiator top tank opening (by-pass ahead of thermostat allows water circulation back to water pump with thermostat closed). Opens at 161°F

MECHANICAL

CLUTCH: Long Model 11CF-10 1/2 TI (60S, 61, 62), 11CF-TI (75). Single plate, dry disc, semi-centrifugal. **NOTE**—No clutch with Hydra-Matic Drive.

Pedal Adjustment—7/8-1 1/8" free travel. Adjusting nut located on connector link at clutch fork.

Facings—Woven. I. D. 7" (All Series), O. D. 10 1/2" (60S, 61, 62), 11" (75). Thickness .137" (All Series).

HYDRA-MATIC DRIVE: Optional on all models.

Linkage Adjustment—Make all adjustments in order and exactly as follows:

(1) **Manual Control Linkage**—Disconnect manual control rod from control lever on transmission case, move control lever to extreme forward and upward position (lever will be held in this position by detent ball). Move Selector Lever on steering column to Neutral Position (against stop). Adjust clevis on lower end of control rod until clevis pin can just be inserted freely through clevis and control lever, tighten clevis locknut and install clevis pin.

(2) **Throttle Control Rod**—Set engine idling speed at 375 Engine RPM. with engine warm (fast idle inoperative). Disconnect throttle rod trunnion at carburetor by removing forward end of retracting

spring, install gauge pin in holes in upper relay lever and distributor housing so that lever is locked in position, adjust trunnion on throttle connector rod so that it slides freely into throttle lever without disturbing slow idle position of throttle, install retracting spring.

(3) **Throttle Control Lower Relay Lever**—With upper relay lever locked by gauge pin inserted through lever into hole in distributor housing, disconnect clevis at throttle lever on transmission case and disconnect lower end of vertical rod connecting upper and lower relay levers. Install second gauge pin through hole in lower relay lever and hole in bell housing so that lever is locked in position, adjust vertical rod by bending rod forward or backward at original bend in rod until it can be connected to lower relay lever (CAUTION—use care to preserve original alignment of rod). Connect vertical rod and remove gauge pin from lower relay lever. Do not remove gauge pin from upper relay lever until adjustments (4) and (5) are completed.

(4) **Throttle Valve Lever**—With upper relay lever locked by gauge pin, disconnect throttle rod at throttle lever on transmission case, hold throttle lever in extreme rear position (against stop), pull throttle rod back to remove all play in linkage, adjust clevis on end of rod so that clevis pin enters clevis and throttle lever freely, then screw clevis three complete turns forward on rod, tighten clevis locknut and connect rod.

(5) **Upper Relay Lever Position**—With upper relay lever locked by gauge pin, disconnect trunnion on horizontal rod connected to upper relay upper lever, adjust trunnion until it will slide freely into relay upper lever when center of hole in lever is exactly 9/16" (Series 60S, 61, 62), 1 5/16" (Series 75) from face of dash. Remove gauge pin from relay lever.

(6) **Accelerator Pedal Rod**—With upper relay lever free (gauge pin removed), disconnect accelerator pedal rod from lower lever of upper relay lever, hold carburetor throttle valve in wide open position and depress accelerator pedal to floor, adjust accelerator pedal rod by turning rod in trunnion until end of rod slips freely into upper relay lower lever, connect rod. **CAUTION**—Recheck adjustment to make certain that carburetor throttle lever is against its wide open stop when pedal depressed to floor.

Lubrication—Capacity 12 1/2 qts. Check level and add "Cadillac Hydra-Matic Fluid" at 1000 mile intervals. **CAUTION**—Run engine for at least one minute before checking fluid level (dip stick in filler plug hole under sheet metal cover under right side of front compt. rug). Use care not to allow dirt to fall into transmission case. Keep fluid level at "Full" mark. When system drained (12000 mile intervals), install 8 qts., run engine for 1 minute, add fluid until level at "Full" mark (approx. 4 1/2 qts. additional).

FRONT SUSPENSION: Independent, parallelogram type with coil springs. See Specification Table Page 38.

BRAKES: Bendix Hydraulic "No Eccentric" type. Hand lever applies rear wheel service brakes.

Clearance—.007-.010" (.015" each end of secondary shoe with primary shoe forced out against drum). **Drum Diameter**—11.995-12.005".

Lining—Moulded Type. Width 2 1/4" (Front Wheels All Series), 2" (Rear Wheels 60S, 61, 62), 2 1/2" (Rear Wheels 75). Thickness 3/16". Length per shoe 11 17/32" (Front primary shoes All Series), 12 31/32" (Rear secondary shoes All Series).

CHEVROLET

HOOD LOCK: Hood is Alligator type. To raise hood, pull out lock button on instrument panel, pull forward on safety catch under front edge of hood.

MODEL IDENTIFICATION

PASSENGER CARS

DJ Stylemaster
DK Fleet Master & Fleetline

TRUCKS

Series	First	Second	Type	Wheelbase
CK	DP	Half-Ton	115"	
	DR	3/4 Ton	125 1/4"	
	DS	One Ton	134 1/2"	
OR	PJ	1 1/2 Ton	134 1/2"	
OS	PK	1 1/2 Ton	160"	
OE	PV, PVS	2 Ton	134 1/2"	
OF	PW, PWS	2 Ton	160"	
OH	PP	2 Ton (C-O-E)	109"	
OI	PR	2 Ton (C-O-E)	132 1/2"	
OJ	PS	2 Ton (C-O-E)	158"	
OW	PL	School Bus	160"	
OY		School Bus	195"	
OG	PX	School Bus	195"	

SERIAL NUMBER: First No. 1001 with model prefix as indicated in model designation above. Stamped on plate on right front body hinge pillar (Pass. Cars), on right hand side of cowl under engine hood (Regular Trucks), on rear of cowl inside cab (Cab-Over-Engine Trucks).

ENGINE NUMBER: Stamped on right side of crankcase to rear of distributor. **NOTE**—Trucks with Heavy Duty 235 cu.in Engine are distinguished by engine number prefix "AG" or "BG" (Regular Trucks), "AL", "BL" or "DEA" (Cab-over-Engine Trucks).

TUNE-UP

COMPRESSION: Pressure—110 lbs. minimum at cranking speed of 65 RPM (All engines).

VACUUM READING: Steady 20-22" idling at 400 RPM.

FIRING ORDER: 1-5-3-6-2-4.

SPARK PLUGS: AC No. M-8 (Passenger Cars), No. 104 (Trucks). 10 mm. Metric Type. Gaps—.040"

CAUTION—Use only steel spark plug gaskets with these plugs. For sustained high speed driving, use truck type No. 104 plugs on passenger cars (M-8 plugs have aluminum oxide insulator with skirt at lower end which retains heat and is designed to burn off carbon deposits).

IGNITION: See Coil, Condenser, and Distributor.

Breaker Gap—.018". Cam Angle—38° (closed).

Breaker Arm Spring Tension—17-21 ozs.

Rotation—Clockwise viewed from above.

Automatic Advance—Starts at 300 RPM. Maximum advance 19 3/4° at 1725 RPM. (Distr. degrees & RPM).

Vacuum Advance—Starts with 7" vacuum. Maximum advance 10° (distr.) with 16-20" of vacuum.

IGNITION TIMING: Std. Setting—5° BTDC.

Timing Mark—Steel ball insert in flywheel lined up with pointer in inspection hole in right front face of housing with Octane Selector set at "0". Then adjust Octane Selector as follows:

Octane Selector Setting—Set for slight ping when accelerating engine with wide open throttle.

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CARBURETION: See Carburetion.

Idle Setting—Adjust idle adjusting screw for smooth idling with warm engine (screw $1\frac{1}{4}$ - $2\frac{1}{4}$ turns open except on C-O-E models, $\frac{1}{2}$ - $1\frac{1}{2}$ turns open on C-O-E), turn screw out for richer mixture. Idle speed 450-500 Engine RPM.

Float Level (exc. C-O-E)— $\frac{1}{2}$ " from top of float at free end to machined surface (gasket seat) on bowl cover with valve seated (invert to check).

Float Level (C-O-E)—Top of float $1/32$ - $1/16$ " below top edge of bowl with valve seated.

Accelerating Pump (exc. C-O-E)—Not adjustable.

Accelerating Pump (C-O-E)—Inner Hole—Summer, Outer Hole—Winter.

Fuel Pump Pressure: $3\frac{3}{4}$ lbs. maximum.

MANIFOLD HEAT CONTROL: Thermostatic type. Check for free operation when tuning engine. Spring should be wound up just enough to slip end over manifold pin (approx. $\frac{1}{2}$ turn). **CAUTION**—Excessive tension may cause valve to stick with detonation and poor performance.

VALVES: See Valve Timing.

Tappet Clearance (Std.)—.006" (.006-.008") Intake, .013" (.013-.015") Exhaust with engine Hot (normalized by idling for 20 minutes).

Tappet Clearance (Econ. Eng.)—.010" Intake, .016" Exhaust with engine Hot (normalized).

Tappet Clearance (Heavy Duty Trucks)—.010" Intake, .020" Exhaust with engine Hot (normalized).

STARTING: See Battery, Starter, Generator, and Regulator.

IGNITION

REVERSING SWITCH: Delco-Remy 1907122. Has improved seal to prevent entrance of dust and foreign material. Operates in same manner as 1942 type (connected to starter, reverses polarity in ignition primary circuit each time starter operated).

COIL: Delco-Remy No. 1115141. Special type for use with Reversing Switch. On right side of engine.

Ignition Current—2.5 amperes idling, 4.5 stopped.

CONDENSER: Delco-Remy Part No. 1882239. Special type for use with special coil and reversing switch. Capacity—28-32 microfarad.

DISTRIBUTOR: Delco-Remy No. 1110090. Single breaker, 6 lobe cam, full automatic advance with auxiliary vacuum spark control and Octane Selector adjustment. **NOTE**—Distributor has insulated breaker plate and ground terminal for use with Reversing Switch.

See Tune-Up data for Distributor specifications.

IGNITION TIMING: See Tune-Up for specifications.

CARBURETION

CARBURETOR (Cars & Trucks exc. C-O-E): Carter (Chevrolet) Model W1, Type 574-S (Std.), 616-S (Econ. Models). $1\frac{1}{4}$ " Single Barrel, downdraft type. See Tune-Up for carburetor adjustment directions.

Std Metering Rod—No. 75-485 (574-S), No. 75-508 (616-S). Checking Gauge No. T109-25 (2.795").

Metering Rod Jet—No. 120-115S—.093" (574-S), No. 120-49S—.0835" (616-S).

CARBURETOR (C-O-E Trucks): Carter Model BB1, Type 517-S. $1\frac{1}{16}$ " Single Barrel, Updraft type. See Tune-Up for carburetor adjustment directions.

Std. Metering Screw—No. 159-98 (366-370 cc. per minute).

THROTTLE CRACKER: Interconnected starter pedal and throttle linkage (opens throttle for starting).

Adjustment—With idle speed correctly set for 450-500 Eng. RPM., loosen lock nut, adjust bolt on accelerator rod for $\frac{1}{8}$ " clearance between head of bolt and lug on starter pedal cross-shaft.

FUEL PUMP: AC. Type AF. Diaphragm type. Replacement Pump AC. No. 429. Pressure— $3\frac{3}{4}$ lbs. max.

AIR CLEANER: AC. Oil-wetted type (Std.), Heavy Duty Oil-bath type (Optl.).

Servicing (Oil-wetted type)—Remove and clean filter element in gasoline, drain dry, re-oil by dipping in engine oil at 2000 mile intervals or more often if required by operating conditions.

Servicing (Oil-bath type)—Remove and clean filter element in gasoline, clean out oil reservoir and refill to indicated level with new engine oil (approx. 1 pint required), at 2000 mile intervals or more often if required by operating conditions.

ELECTRICAL

BATTERY: Delco-Remy 15X-3. 6 volt, 15 plate, 100 Ampere Hour capacity (20 hour rate).

Grounded Terminal—Negative (—) terminal.

Location—In engine compartment on right side (Pass. cars), under right front floor (Trucks).

STARTER: Delco-Remy 1107061. Armature 1867897.

Drive—Overrunning clutch and manual pinion shift.

Rotation—Counter-clockwise at commutator end.

Brush Spring Tension—24-28 ozs.

Performance Data

Torque	R.P.M.	Volts	Amperes
0 ft. lbs.	5000	5.0	65
12 " "	Lock	3.37	525

GENERATOR: Delco-Remy No. 1102667. Armature 1879002. Two brush (shunt) type with voltage and current regulation. Ventilated.

Maximum Charging Rate—35 amperes, 7.3-7.7 volts, 2400 RPM., 25 MPH (Pass. Cars).

Performance Data

Cold	Amperes	Volts	R.P.M.
.....	30	8.0	1750

Rotation—Counter-clockwise at commutator end.

Brush Spring Tension—25 ozs.

Field Current—1.67-1.82 amperes at 6.0 volts.

Belt Adjustment— $1\frac{1}{2}$ " total belt deflection midway between generator and fan pulleys.

REGULATOR: Delco-Remy No. 1118201. Single Core Voltage & Current Type.

Relay Closes—6.2-6.7 volts at operating temp.

Relay Opens—0-4 amperes discharge current.

Voltage Setting—7.2-7.4 volts hot (operating temp.).

Current Setting—32-34 amperes (operating temp.).

Checking & Adjusting—See article in Electrical Equipment Section on this unit.

LIGHTING: Headlamps—Guide Sealed Beam type.

Adjustment—Aim upper beam straight ahead (hot spot center 3" below lamp center height at 25').

Lamp Bulbs—See Specification Table on Page 31.

FUSES: Lighting—30 ampere. On lighting switch.

ENGINE

ENGINE SPECIFICATIONS (Pass. Cars & Light Trucks): Six Cylinder Valve-in-Head ("I" Head) type.

Bore— $3\frac{1}{2}$ " **Stroke**— $3\frac{3}{4}$ "

Displacement—216.5 cu. ins. **Rated H.P.**—29.4

Developed Horsepower—90 at 3300 RPM.

Compression Ratio—6.5-1 Std. Cast Iron Head.

ENGINE SPECIFICATIONS (Heavy Duty Trucks): Six Cylinder, Valve-in-Head ("I" Head) type.

Bore— $3\frac{9}{16}$ " **Stroke**— $3\frac{15}{16}$ "

Displacement—235.5 cu. ins. **Rated H.P.**—30.4

Developed Horsepower—93 (Conv. Trucks with Downdraft Carb.), 90 (C-O-E Trucks with Updraft Carb.) at 3100 RPM.

Compression Ratio—6.62-1 Std. Cast Iron Head.

PISTONS: Three ring, cast iron, flat head, surface treated, cam ground (oval), slipper skirt type.

Removal—Pistons and rods removed from above.

Clearance—Fit pistons with feeler gauges inserted between piston and cylinder wall at right angles to pin. Piston should pass through bore with light pressure on .002" feeler and lock on .003" feeler.

Replacement Pistons—Finished pistons (with pins) furnished Std. Size & .003" (235 cu.in Eng. only), .005" (216 cu. in. Eng. only), .010", .020", .030", .040" Oversize.

PISTON RINGS: Width End Gap Side Clearance
Compr. (#1,2) .1235-.1240" .005-.015" .0015-.003"
Oil (#3) .1860-.1865" .005-.015" .002-.0035"

Installation Note—Install compression rings with mark "TOP" upward (rings have tapered face).

Replacement Rings—Std. Size and .005", .010", .015", .020", .030", .040" Oversize.

PISTON PIN: Locked in rod (piston bronze bushed). Clearance—Tight thumb push fit in piston bushing at room temperature.

Replacement Pins—Std. Size and .003", .005", .010" Oversize. **NOTE**—Pins furnished with new pistons.

CONNECTING ROD BEARINGS: Spun babbitt type. Solid shims furnished for adjustment.

Clearance—Selective fit (remove shims until snap fit secured when rod will snap from one side to the other with light tap of 8 oz. hammer but will be tight on hand pressure, then replace one .002" shim).

If unequal number of shims required, place extra shim on camshaft side.

Sideplay—.004-.012" (sideplay of rod in piston bosses .025" minimum).

Replacement Bearings—Install Exchange Rods.

Installing Rods—Numbers on rods and bearing caps must be together and installed in same numbered cylinder with numbers and pin clamp bolt toward camshaft side of engine. Install oil dippers on rods with mouths toward camshaft side of engine.

CRANKSHAFT BEARINGS: Slip-in, steel-backed, babbitt lined type. Shims are solid type.

Clearance—.002-.004" (remove shims until slight drag noted when shaft turned by hand, then replace one .002" shim). If unequal number of shims used, place extra shim on same side for all bearings.

Endplay—.004-.007" at #3 bearing.

CAMSHAFT SETTING: Mesh marked tooth of camshaft gear opposite marked space between teeth of crankshaft gear.

VALVES Head Diam. Seat Angle Stem Clearance
Intake1 41/64".....30°......001-.003"
Exhaust1 15/32".....30°......002-.004"

Valve Spring Pressure—49-56 lbs. at 1 13/16" (closed), 121-133 lbs. at 1 1/2" (open). Free length 2 1/8".

VALVE TIMING

Valve Timing Check—Adjust #1 exhaust valve for zero tappet clearance, turn engine over until this valve just starts to close and triangular mark on

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flywheel lines up with pointer on right front face of flywheel housing, mount dial indicator on rocker shaft support with stem contacting #1 exhaust valve adjusting screw, set dial at .036", turn engine until dial hand just stops moving. Timing is correct if dial reading is zero plus or minus .003". Reset tappet clearance at .013-.015" Hot.

LUBRICATION & COOLING

LUBRICATION: Crankcase Capacity 5 qts. (refill), 5½ qts. (dry).

Normal Oil Pressure—14 lbs. at 21 MPH (Pass. Cars), 2000 Eng. RPM (Trucks).

Checking Engine Oiling System—Oil Pan Trough Height, Connecting Rod Dipper Height, and Oil Nozzle Aim should be checked in same manner as on 1942 models (see Chevrolet Special Shop Notes in Manual) except that new Combination Gauges Nos. J-969-2 (Std. Eng.), J-1646-A (H.D. 235 cu. in. Eng.) are used as follows:

Dipper Height—Gauge has "Go" and "No Go" sections and "Go" section should pass over dipper while "No Go" section should strike dipper. Tap dipper down if too high, replace dipper if too low.

Oil Pan Trough Height—Pin on gauge should pass over edge of trough but clearance should not exceed .015". Grind down edge of trough if too high, reweld trough or replace pan if too low.

COOLING: Capacity—15 qts. (Pass. Cars).

Thermostat—In cylinder head outlet, Starts to open at 140-147°F. (Std. type—marked "143"), 148-155°F. (Alcohol Anti-freeze type—marked "151"), 166-174°F. (Permanent Anti-freeze type—marked "170").

MECHANICAL

CLUTCH: Own Make. Single plate, diaphragm spring, dry disc type.

Pedal Adjustment—Free travel ¾-1". Adjust by loosening locknut and turning adjusting nut on connector link at clutch throw-out fork.

Facings—	I.D.	O.D.	Thickness
Pass. Cars & Half-Ton.....	6⅞"	9⅞"	132-138"
Other Trucks.....	7"	10¾"	137-143"

FRONT SUSPENSION: Independent, parallelogram type with coil springs (Pass. Cars), conventional axle with semi-elliptic springs (Trucks).

See Front Suspension Specification Table on Page 38.

BRAKES: Own Make, Hydraulic type. Hand lever applies rear wheel service brakes.

Clearance—Adjusting cover (on wheel cylinder) backed off 4 Notches from slight drag position. **NOTE**—On trucks with adjusting pinion shaft on rear wheel brakes, this adjustment should be backed off ¾ turn from slight drag position.

Drum Diameter—	Front	Rear
Pass. Cars & Half-Ton.....	11"	11"
¾ Ton DR.....	11"	12"
One Ton DS.....	12"	14"
Other Trucks.....	14"	16"

Lining (Pass. Cars)—Moulded type. Width 1¾". Thickness 3/16" Length per wheel 22 5/8".

Lining (Trucks)—Lining on ½, ¾, 1 Ton Trucks is bonded to brake shoes and cannot be replaced in the field. Install Exchange Brake Shoes as follows:

	Front	Part No.	Rear
Half-Ton.....	3681827.....		3681827
¾ Ton.....	3681129.....		3681116
One Ton.....	3681116.....		3681166

CHRYSLER 6

HOOD LOCK: Hood is Alligator type. To raise hood, pull out lock button under extreme left side of instrument panel, release safety catch under front edge of hood.

MODEL IDENTIFICATION

	Model	Serial No.
Royal.....	C-38S.....	70,011,001
Windsor.....	C-38W.....	70,515,001
Town & Country.....	C-38W.....	71,000,001

SERIAL NUMBER: See model notation (above) for first numbers. Stamped on plate on left front door body hinge post.

ENGINE NUMBER: First No. C-38S- or C38W-1001. Stamped on boss on left side of cylinder block between #1 and #2 cylinders.

TUNE-UP

COMPRESSION: Pressure—125-135 lbs. at cranking speed of 125 RPM. (Std. 6.6-1 Cast Iron Head).

VACUUM READING: Steady 18-21" idling at 6 MPH.

FIRING ORDER: 1-5-3-6-2-4.

SPARK PLUGS: Auto-Lite Type A5. 14 mm. Metric. Gaps—.025"

IGNITION: See Coil, Condenser, and Distributor.

Breaker Gap—.020" Cam Angle—38° (closed).

Breaker Arm Spring Tension—17-20 ozs.

Rotation—Clockwise viewed from above.

Automatic Advance—Starts at 350 RPM., 3° at 400 RPM., Max. advance 12° at 1530 RPM. (Distributor degrees & RPM).

Vacuum Advance—Starts with 5" vacuum. Maximum advance 9° (distr.) with 15" vacuum.

IGNITION TIMING: Std. Setting—2° ATDC.

Timing Mark—Vibration Damper marked "DC" at top dead center position with 15-1° graduations before and after this point. Set timing with 2° graduation after DC mark at pointer on chain case then set manual (octane selector) adjustment: **Manual (Octane Selector) Adjustment**—Set for slight ping in 10-30 MPH. range when accelerating with wide open throttle. Do not vary initial timing more than 4° advance or retard.

CARBURETION: See Carburetion.

Idle Setting—Set idle adjusting screw for smooth idling with warm engine (idle screw ¾-1¼ turns open), turn screw out for richer mixture. Idle speed 6 MPH. (450-475 Eng. RPM. with Hydraulic Trans.).

Float Level—Top of float (not soldered seam) 5/64" plus or minus 1/64" below top edge of bowl.

Accelerating Pump—Center Hole (med. stroke) Normal. Inner Hole—Summer, Outer Hole—Winter, for extreme temperatures.

Fuel Pump Pressure: 4 lbs. maximum.

MANIFOLD HEAT CONTROL: Automatic thermostatic type. See that valve operates freely. When installing coil, wind free end up approx. one turn.

VALVES: See Valve Timing.

Tappet Clearance—.008" Intake, .010" Exhaust, Hot. **NOTE**—Tappet adjusting screws are self-locking type (no locknuts).

STARTING: See Battery, Starter, Generator, and Regulator.

IGNITION

COIL: Auto-Lite No. IG-4806. Mounted directly above distributor on ignition cable bracket.

Ignition Current—2.25 amperes idling, 5 stopped.

CONDENSER: Auto-Lite Part No. IG-3927A.

Capacity—25-.28 microfarad.

DISTRIBUTOR: Auto-Lite No. IGS-4208A-1. Full automatic advance type with auxiliary vacuum spark control and manual (octane selector) adjustment. See Tune-Up for distributor specifications.

IGNITION TIMING: See Tune-Up for settings.

CARBURETION

CARBURETOR: Carter (Ball & Ball) Model EX1 (Std.), Model EV1 (With Fluid Drive & Automatic Trans.), 1½" Single Barrel, downdraft types, **NOTE** Model EV1 has Slow-Closing Throttle and Step-down Switch unit for transmission control. See Tune-Up for carburetor adjustment directions.

Main Metering Jet—No. 159-89S—312-316 cc. per minute (All models).

FAST IDLE: Operated by choke lever. No adjustment **SLOW-CLOSING THROTTLE (EV1):** Electro-magnetic type. No adjustment required.

AUTOMATIC CHOKE: Sisson. Adjust by inserting gauge pin through hole in automatic choke lever shaft and slot in base mounting flange (to position shaft) and adjusting carburetor choke valve lever so that choke valve is closed tightly.

AIR CLEANER: AC. Heavy Duty Oil-bath type.

Servicing—Clean filter element in kerosene, clean out oil reservoir and fill to indicated level with SAE No. 50 engine oil (above 32°F., approx. 1 pint required). Service cleaner whenever sump is half filled with oil and dust sludge. **NOTE**—Crankcase ventilator air cleaner in oil filler cap should be cleaned in kerosene and re-oiled by dipping in SAE No. 50 engine oil at 1000 mile intervals.

FUEL TANK FILTER: New self-cleaning type porous bronze filtering element located in fuel tank. No servicing required (drain tank yearly).

FUEL PUMP: AC. Type AT, Pump Exch. No. 505 (First Cars), Carter Type M594S (Later Cars). Diaphragm type fuel pump. Pressure—4 lbs maximum.

ELECTRICAL

BATTERY: Willard Type. 6 volt, 17 plate, 120 Ampere Hour capacity (20 hour rate).

Grounded Terminal—Positive (+) terminal.

Location—In engine compartment on left side.

STARTER: Auto-Lite MAX-4050. Armature MAW-2030 Drive—Solenoid pinion shift (overrunning clutch).

Rotation—Counter-clockwise at commutator end.

Brush Spring Tension—42-53 ozs. (new brushes).

Cranking Engine—125 RPM., 175 amperes, 5.4 volts.

Performance Data

Torque	R.P.M.	Volts	Amperes
0 ft. lbs.....	5300	5.5	65
12 ".....	300	3.5	500
25 ".....	Lock.....	4.0	880

GENERATOR: Auto-Lite GDZ-4801A. Armature GDZ-2006F. Two brush (shunt) type with voltage and current regulation. Ventilated.

Maximum Charging Rate—35 amperes, 8.0 volts, 1900 RPM. or approx. 25 MPH.

Cold Performance Data

Amperes	Volts	R.P.M.	Amperes	Volts	R.P.M.
0.....	6.4	925	0.....	6.4	1000
8.....	6.75	1140	8.....	6.75	1235
16.....	7.15	1370	16.....	7.15	1460
24.....	7.5	1590	24.....	7.5	1730
35.....	8.0	1900	35.....	8.0	2250

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Rotation—Counter-clockwise at commutator end.
Brush Spring Tension—35-53 ozs. (new brushes).
Field Current—1.60-1.78 amperes at 6.0 volts.
Belt Adjustment—40-50 lbs. tension on generator (spring scale attached to generator field frame).
REGULATOR: Auto-Lite Model VRP-4001A (First), VRP-4401A (Later). Voltage-Current type.
Relay Closes—6.4-7.0 volts (setting 6.4-6.6 volts).
Relay Opens—4.1-4.8 volts (4-6 amps. discharge).
Voltage Setting—7.2-7.5 volts at 70°F.
Current Setting—34-36 amperes.
Checking & Adjusting—See article in *Electrical Equipment Section on this type regulator*.
LIGHTING: Headlamps—Corcoran-Brown Sealed Beam.
Adjustment—Aim upper beam straightahead (hot spot center 3" below lamp center height at 25').
Lamp Bulbs—See *Specification Table on Page 31*.
LIGHTING CIRCUIT BREAKER: Vibrating thermostatic type. Mounted on back of lighting switch. Protects lighting circuits by vibrating to limit current.
FUSES: Clock—2 ampere. In clock lead wire.
Direction Signal—9 ampere. In wire connector back of instrument panel near ammeter.
Transmission Solenoid (Automatic Trans.)—30 ampere. Under transmission relay on left fender side panel.

ENGINE

ENGINE SPECIFICATIONS: Six cylinder, "L" Head.
Bore—3 7/16" **Stroke**—4 1/2"
Displacement—250.6 cu. ins. **Rated H.P.**—28.36
Developed Horsepower—120 at 3800 RPM.
Compression Ratio—6.6-1 Std. Cast Iron Head.
Other engine specifications except Valves (below) are same as for Chrysler Eight. See Chrysler Eight C-39 & C-40 article (following) for specifications and service data on Pistons, Rings, Pins, Connecting Rod Bearings, Crankshaft Bearings, and Camshaft Setting.
VALVES: Head Diam. Seat Angle Stem Clearance
 Intake 1 23/32" 45°0015-.0035"
 Exhaust 1 17/32" 45°002-.004"
Valve Spring Pressure—40-45 lbs. at 1 1/4" (closed), 107-115 lbs. at 1 3/8" (open). Free length 2".

VALVE TIMING

Valve Timing Check—With .014" (cold) tappet clearance, #6 intake valve opens 12° BTDC. with 12th graduation before DC mark on vibration dampener at pointer on chain case cover. Reset tappet clearance at .008" with engine hot.

LUBRICATION & COOLING

LUBRICATION: Crankcase Capacity—5 qts.
Normal Oil Pressure—55-65 lbs. at 30 MPH.
CAUTION—Oil pressure of 35-45 lbs. at driving speeds indicates that oil filter element is clogged and should be replaced (new "Full-flow" system with oil flow through filter to engine).
Oil Filter—New Chrysler "Full-flow" type. Replace filter element at 5000 mile intervals or whenever oil pressure drops to 35-45 lbs. at driving speeds.
COOLING: Capacity—18 qts. (4 1/4 gals.).
Pressure Valve—In radiator filler cap.
Thermostat—In cylinder head outlet with by-pass to pump for re-circulation when closed. Starts to open at 157-162°F., fully open at 183-187°F.

MECHANICAL

Mechanical equipment and specifications other than Clutch (below) are same as for the Chrysler Eight (except as noted in Chrysler Eight article).
CLUTCH: Borg & Beck Model 10A7 (Std.), 9A7 (With Fluid Drive & Hydraulically-operated Transmission), 11A6 (Taxicab). Single plate, dry disc type.
NOTE—Cover assembly marked #940 (9A7), #953 (10A7), #941 (11A6).
Pedal Adjustment—Set pedal to just clear toeboard (adjust stop screw on lower end of pedal), and for 1" free travel (adjust nut on connector link at release fork. **CAUTION**—Do not disturb turnbuckle on clutch pedal rod (controls setting of over-center spring which does not require adjustment unless setting disturbed).
Facings—Woven type.

	I.D.	O.D.	Thickness
9A7	6"	9 1/4"	1/8"
10A7	7"	10"	1/8"
11A6	6 1/2"	11"	1/8"

See Chrysler Eight C-39 & C-40 article (following) for data on Gyrol Fluid Drive and Hydraulically-operated Transmission, Independent Suspension and Brakes.

CHRYSLER 8

HOOD LOCK: Same as on Chrysler Six C-38.

MODEL IDENTIFICATION

	Model	Serial No.
Saratoga	C-39K	6,765,001
New Yorker	C-39N	7,025,001
Crown Imperial	C-40	

SERIAL NUMBER: See model notation (above) for first numbers. Stamped on plate on left front door body hinge post.

ENGINE NUMBER: First No. C-39K-, or C-39N-1001 (C-39), C-40-1001 (C-40). Stamped on boss on left side of crankcase between #2 and #3 cylinders.

TUNE-UP

COMPRESSION: Pressure—125-135 lbs. at cranking speed of 125 RPM. for Std. 6.8-1 Cast Iron Head.
VACUUM READING: Steady 18-21" idling at 6 MPH.
FIRING ORDER: 1-6-2-5-8-3-7-4.

SPARK PLUGS: Auto-Lite Type A5. 14 mm. Metric. Gaps—.025"

IGNITION: See Coil, Condenser, and Distributor.

Breaker Gap—.018" **Cam Angle**—27° (closed).

Breaker Arm Spring Tension—17-20 ozs.

Rotation—Clockwise viewed from above.

Automatic Advance—Starts at 350 RPM., 3° at 400 RPM. Maximum 12° at 1750 RPM (Distributor degrees & RPM).

Vacuum Advance—Starts with 5" vacuum. Maximum advance 8° (distr.) with 17" vacuum.

IGNITION TIMING: Std. Setting—2° ATDC.

Timing Mark—Vibration Dampener marked "DC" at top dead center position with 15-1° graduations before and after this point. Set timing with 2° graduation after DC mark at pointer on chain case cover, then set manual (octane selector) adjustment: **Manual (Octane Selector) Adjustment**—Set for slight ping in 10-30 MPH. range when accelerating with wide open throttle. Do not vary initial timing more than 4° advance or retard.

CARBURETION: See Carburetion.

Idle Setting—Adjust both idle adjusting screws

equally for smooth idling with warm engine (turn screws out for richer mixture). Idle speed 6 MPH.
Float Level—Fuel level 5/8" below top edge of bowl (even with bottom of inspection plug hole on side of bowl with engine idling).

Accelerating Pump—Inner Hole (min. stroke)—Summer, Outer hole (max. stroke)—Winter.

Fuel Pump Pressure: 4 lbs. max.

MANIFOLD HEAT CONTROL: Automatic thermostatic type. See that valve operates freely. When installing coil, wind free end approximately 1 turn.

VALVES: See Valve Timing.

Tappet Clearance—.008" Intake, .010" Exhaust, Hot
NOTE—Tappet adjusting screws are self-locking (no locknuts).

STARTING: See Battery, Starter, Generator, and Regulator.

IGNITION

COIL: Auto-Lite No. CE-4030. Mounted directly above distributor on ignition cable bracket.

Ignition Current—2.25 amperes idling, 5 stopped.

CONDENSER: Auto-Lite Part No. IG-3927.

Capacity—.25-.28 microfarad.

DISTRIBUTOR: Auto-Lite No. IGT-4201-1. Full automatic advance type with auxiliary vacuum spark control and manual (Octane Selector) adjustment. See Tune-Up for distributor specifications.

IGNITION: See Tune-Up for settings.

CARBURETION

CARBURETOR: Stromberg Model AAV-2. 1 1/4" Duplex (double barrel), downdraft type with separate automatic choke.

See Tune-Up for carburetor adjustment directions.

THROTTLE GUARD: Vacuum operated throttle "kicker" designed to prevent engine stalling.

Setting—.010" clearance between plunger and throttle guard lever adjusting screw with throttle valve in hot or slow idle position.

FAST IDLE: Setting—Choke valve 1/8" open with fast idle screw against first step of fast idle cam.

AUTOMATIC CHOKE: Sisson. Adjust by installing adjusting tool on automatic choke (cover removed) so that choke held in closed position and adjusting choke valve lever on carburetor choke valve shaft so that choke valve tightly closed.

AIR CLEANER: AC. Heavy Duty Oil-bath type.

Servicing—Clean filter element in kerosene, clean out oil reservoir and fill to indicated level with SAE No. 50 engine oil (above 32°F., approx. 1 pint required). Service cleaner whenever sump half-filled with oil and dust sludge. **NOTE**—Crankcase ventilator air cleaner in oil filler cap should be cleaned in kerosene and re-oiled by dipping in SAE No. 50 engine oil at 1000 mile intervals.

FUEL TANK FILTER: New self-cleaning type porous bronze filtering element located in fuel tank. No servicing required (drain tank yearly).

FUEL PUMP: AC Type AW. Pump Exchange AC No. 514. Diaphragm type. Pressure—4 lbs. max.

ELECTRICAL

BATTERY: Auto-Lite Type CF-2-19R (C-39), Willard Type (C-40). 6 volt, 19 plate, 135 Ampere Hour capacity (20 hour rate).

Grounded Terminal—Positive (+) terminal.

Location—In engine compartment on left side.

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All other electrical equipment units and specifications (Starter, Generator, Regulator, Lighting, Lighting Circuit Breaker, and Fuses) same as for Chrysler Six. See Chrysler Six C-38 article (preceding).

ENGINE

ENGINE SPECIFICATIONS: 8 Cylinder, "L" Head.

Bore— $3\frac{1}{4}$ " Stroke— $4\frac{7}{8}$ "

Displacement—323.5 cu. ins. Rated H.P.—33.8

Developed Horsepower—140 at 3600 RPM.

Compression Ratio—6.8-1 Std. Cast Iron Head.

PISTONS: Four-ring, aluminum alloy, cam ground, U-slot type. Length— $3\frac{7}{8}$ "
Weight—18.5 ozs. (C-38 Six), 16.5 ozs. (C-39 & C-40 Eight)—without rings or pins.

Removal—Pistons and rods removed from above.

Clearance—Fit pistons with .002" x $\frac{1}{2}$ " feeler inserted between piston and cylinder wall on side opposite slot and at right angles to piston pin. Pull required to withdraw feeler should be 5-7 lbs.

Replacement Pistons—Finished pistons furnished Std. Size and .005", .020", .030", .040", .060" Oversize; Semi-finished pistons in two sizes only: 1) Std. to .023" Oversize, 2) .025" to .060" Oversize.

Installing Pistons—U-slot away from valves.

PISTON RINGS: Width End Gap Side Clearance
Compr. (#1) $\frac{3}{32}$ " .007-.015" .0025-.004"
Compr. (#2) $\frac{3}{32}$ " .007-.015" .002-.0035"
Oil (#3, 4) $\frac{5}{32}$ " .007-.015" .001-.0025"

Replacement Rings—Furnished Std. Size and .005", .020", .030", .040", .050", .060" Oversize.

PISTON PIN: Floating type (lock ring each end).

Clearance—Thumb push fit at 130°F. in piston, tight thumb push fit at 70°F. in rod bushing.

Replacement Pins—Furnished Std. Size and .0006", .003", .008" Oversize.

CONNECTING ROD BEARINGS: Replaceable, precision type steel-backed, babbitt-lined. No shims.

Clearance—.001-.0015". Sideplay—.0055-.0115"

Replacement Bearings—Std. size and .001", .002", .010", .012" Undersize.

Installing Rods—Oil metering hole in lower end of connecting rod toward camshaft side.

CRANKSHAFT BEARINGS: Replaceable precision type, steel-backed, babbitt-lined. No shims.

Clearance—.001-.0015" Endplay—.003-.007" (rear).

Replacement Bearings—Std. size and .001", .002", .010", .012" Undersize.

CAMSHAFT SETTING: Mesh chain with sprockets turned so that marks on both sprockets are adjacent and in line with a straightedge across shaft centers.

VALVES Head Diam. Seat Angle Stem Clearance
Intake1 $17\frac{32}$ "45°0015-.0035"
Exhaust1 $11\frac{32}$ "45°002-.004"

Valve Spring Pressure—52-58 lbs. at 2 $1\frac{32}$ " (closed)
129-137 lbs. at 1 $21\frac{32}$ " (open). Free length 2 $25\frac{64}$ ".

VALVE TIMING

Valve Timing Check—With .011" tappet clearance (cold), #8 intake valve opens with piston 6° before top dead center with 6th graduation before "DC" mark on vibration dampener at pointer on chain case cover. Reset tappet clearance at .008" Hot.

LUBRICATION & COOLING

LUBRICATION: Crankcase Capacity—6 qts.

Normal Oil Pressure—55-65 lbs. at 30 MPH.

CAUTION—Oil pressure of 35-45 lbs. at driving speeds indicates that oil filter element is clogged and should be replaced (new "Full-flow" system with oil flow through filter to engine).

Oil Filter—New Chrysler "Full-flow" type. Replace filter element at 5000 mile intervals or whenever oil pressure drops to 35-45 lbs. at driving speeds.

COOLING: Capacity—26 qts.

Pressure Valve—In radiator filler cap.

Thermostat—In cylinder head outlet with by-pass to pump for re-circulation when closed. Starts to open at 157-162°F. Fully open at 183-187°F.

MECHANICAL

CLUTCH: Borg & Beck Model 10A6. Single plate, dry disc type. NOTE—Cover assembly stamped #961.

Pedal Adjustment—Set pedal to just clear toeboard (adjust stop screw on lower end of pedal), and for 1" free travel (adjust nut on connector link at clutch fork). CAUTION—Do not disturb turnbuckle on clutch pedal rod (controls setting of over-center spring which does not require adjustment unless setting disturbed).

Facings—Woven type. I.D. 6" O.D. 10" Thickness $\frac{1}{8}$ ".

HYDRAULICALLY-OPERATED TRANSMISSION:

Optl. on C-38 Six & C-39 Eight. Four-speed semi-automatic transmission with Gyrol Fluid Drive. Same design as DeSoto Tip-Toe Shift Transmission. See DeSoto S11 article (following) for data.

GYROL FLUID DRIVE: Optl. with Hydraulically-operated Transmission. Hydraulic coupling on flywheel.

Servicing—Check fluid level at end of first 1000 miles and at 10,000 mile intervals thereafter. Maintain fluid level at filler plug hole height (use only Mopar Fluid Drive Fluid).

FRONT SUSPENSION: Independent parallelogram type with coil springs. See Front Suspension Specification Table Page 38.

BRAKES: Lockheed Hydraulic Two-Cylinder Type (Front Wheels), Double Anchor Type (Rear wheels). Hand lever applies independent shaft brake.

Clearance—.006" at each end of each shoe.

Drum Diameter—11" (C-38 Six), 12" (C-39 & C-40 Eight). Centrifuse type.

Lining—Molded type. Width 2". Thickness $13\frac{64}$ ".

Length per wheel— Front Rear
C-38 Six23"20 $3\frac{8}$ "
C-39, C-40 Eight25 $1\frac{8}$ "22 $3\frac{16}$ "

Hand Brake: Independent type with brake drum mounted on drive shaft at rear of transmission.

Drum Diameter—6" (C-38 Six), 7" (C-39, C-40 Eight)

Lining— Width Thickness Length
C-38 Six2"5/32"16 $11\frac{16}$ "
C-39, C-40 Eight $2\frac{1}{2}$ "5/32"20"

Adjustment—.015-.020" clearance around band. Adjust anchor screw for clearance at this point, adjust guide bolt adjusting nut for clearance at lower end of band, adjust large adjusting bolt nut (at lower end of bolt below springs) for clearance at upper end of band.

Hand Brake Signal Note—Left Hand Map Light will flash (with ignition "on") as a warning until hand brake is released.

CROSLEY

HOOD LOCK: Hood is Alligator type hinged at cowl. To raise hood, release hood lock button on instrument panel, then release safety catch under front edge of hood.

MODEL IDENTIFICATION

SERIAL NUMBER: First No. CC46-100. Stamped on front face of dash panel in engine compartment.

ENGINE NUMBER: First No. CC46-100. Stamped on pad on left side of crankcase below #1 cylinder.

TUNE-UP

COMPRESSION: Pressure—135 lbs. (110 lbs. min. hot) at cranking speed of 260 RPM. All cylinders must be equal within 10 lbs.

VACUUM READING: Steady 18-20" idling at 7 MPH.

FIRING ORDER: 1-3-4-2.

SPARK PLUGS: Auto-Lite No. A5B. 14 mm. Metric. Gaps—.025"

IGNITION: See Coil, Condenser, and Distributor.

Breaker Gap—.020" (.020-.024").

Cam Angle—46° closed (distr. degrees).

Breaker Arm Spring Tension—17-20 ozs.

Rotation—Counter-clockwise viewed from above.

Automatic Advance—Starts at 350 RPM. Maximum 12° at 1000 RPM (Distr. degrees & RPM).

IGNITION TIMING: Std. Setting—12° BTDC.

Timing Mark—First flywheel mark (second mark is TDC) in inspection hole in right front face of flywheel housing.

CARBURETION: See Carburetion.

Main (High Speed) Adjustment—Initial setting 2 full turns open of adjusting screw. With engine warm and running with 1/3 throttle opening, turn screw in until engine loses speed, then out until maximum speed secured. Final setting $1\frac{1}{2}$ - $1\frac{3}{4}$ turn open.

Idle Adjustment—After making Main Adjustment (above), close throttle and set stop screw for slightly faster than normal idle speed, turn idle adjusting screw in until engine misses, then turn screw out until engine fires smoothly. Final setting $\frac{3}{4}$ - $1\frac{1}{4}$ turn open. Set throttle stop screw for idle speed of 7 MPH.

Float Level—Fuel level $23\frac{32}$ " below top edge of bowl or even with bottom of inspection plug hole on side of bowl. CAUTION—Remove idle adjusting screw, spring, and idle tube before removing air horn and float bowl cover assembly.

Accelerating Pump—None.

Fuel Pump Pressure: $2\frac{1}{2}$ -3 lbs.

VALVES: See Valve Timing.

Tappet Clearance—.004-.005" Intake, .006-.007" Exhaust, Cold. NOTE—First cars adjustable only by grinding valve stem, later cars have adjusting shims.

STARTING: See Battery, Starter, and Generator.

IGNITION

COIL: Auto-Lite Model IG-4065. Mounted on dash.

Ignition Current—2 amperes idling, 5 stopped.

CONDENSER: Auto-Lite.

Capacity—.20-.25 microfarad.

DISTRIBUTOR: Auto-Lite Model IGW-4181. Automatic advance type (no vacuum control).

See Tune-Up for distributor specifications.

IGNITION TIMING: See Tune-Up for settings.

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CARBURETION

CARBURETOR: Tillotson Model DY-9B. 7/8" Single barrel, downdraft type with Main (High Speed) and Idle adjustments. Choke control is manual.

See Tune-Up for adjustment instructions.

Metering Jets: Tillotson No. 07009 Idle Tube, No. 07973 Main Nozzle (adjustable).

AIR CLEANER: AC. Oil-wetted type. Clean and re-oil filter element at 2000 mile intervals.

FUEL PUMP: AC. Diaphragm type.
Pressure—2½-3 lbs.

ELECTRICAL

BATTERY: Auto-Lite Type AB-13. 6 volt, 13 plate, 80 Ampere Hour capacity (20 hour rate).

Grounded Terminal: Positive (+) terminal.

Location: Under hood on left hand side.

STARTER: Auto-Lite MAK-4027.

Drive: Bendix Drive No. A-2220, Barrel type.

Rotation: Counter-clockwise at commutator end.

Brush Spring Tension: 38-61 ozs. (new brushes).

Performance Data

Torque	R.P.M.	Volts	Amperes
0 ft. lbs.	5000	5.5	70
1.35 "	1880	5.0	200
4.8 "	220	4.0	400
7.0 "	Lock	4.0	520

GENERATOR: Auto-Lite Model No. GAS-0190. Third brush control type.

Adjustment: Shift third brush by hand, counter-clockwise to increase charging rate, clockwise to decrease charging rate. Std. setting of third brush 2 commutator bars (min.) to 2 commutator bars plus 1 mica strip (max.) from nearest main brush.
Maximum Charging Rate: 12 amperes at 8.0 volts.

Cold Performance Data Hot

Amperes	Volts	R.P.M.	Amperes	Volts	R.P.M.
0	6.4	880	0	6.4	975
5	7.0	1160	5	7.2	1420
10	7.6	1650	10.2	8.0	2950
14	8.0	2800			

Rotation: Counter-clockwise at commutator end.

Brush Spring Tension: 15-20 ozs.

Field Current: 4.09-4.52 amperes at 6.0 volts.

Belt Adjustment: Loosen two nuts on fan shaft bracket, move bracket up until belt deflection midway between generator and fan pulleys is ½" with thumb pressure.

CUTOUT RELAY: Auto-Lite Model CB-4025. On generator mounting bracket.

Cuts In: 6.5-7.25 volts.

Cuts Out: 5-2.5 ampere discharge current.

Contact Gap: .015-.045" **Air Gap:** .010-.013" closed.

LIGHTING: Headlamps—Pre focused type.

Headlamp Adjustment: Upper beam aimed straight ahead with top of hot spot at lamp center height at 25'.

Lamp Bulbs: See Specification Table on Page 31.

FUSES: Lighting—20 ampere. On lighting switch.

ENGINE

ENGINE SERVICE NOTE: Cylinder heads are integral with cylinder barrels and cylinder block must be removed from crankcase for work on valves, pistons, rings, etc.

ENGINE SPECIFICATIONS: Four cylinder, Overhead Valve type with overhead camshaft. Cylinder block is built-up type bolted on aluminum crankcase with separate pressed steel oil pan.

Bore—2.5". Stroke—2.25". Displacement—44 cu. ins.
Rated Horsepower—10, Developed 26.5 at 5200 RPM.
Compression Ratio—7.5-1

PISTONS: Three ring, aluminum alloy, cam ground, oxide finish. Weight 4.92 ozs. Length 1.908".
Clearance—.0165" (top), .002-.0035" (skirt). Use .002" feeler ½" wide to fit pistons. Pull to withdraw feeler should be 4-6 lbs.

Removal: Pistons and rods withdrawn through lower end of cylinder when cylinder block removed from crankcase (cylinder head integral with block).

Replacement Pistons: Furnished .005", .010", .020", .030" Oversize.

PISTON PINS: Floating type with aluminum plug inserted in each end of pin.

Clearance: Tight thumb push fit in rod bushing at 70°F. .0001-.0006" clearance in piston at 70°F.

CAUTION: Heat piston to 160° to install pin.

Replacement Pins: .001", .002", .003" Oversize.

PISTON RINGS: Width End Gap Side Clearance
Compr. (#1, 2) 1/16" .007-.017" .0025-.004"
Oil Cont. (#3) 3/32" .007-.015" .0015-.003"

Installation Note: Compression ring beveled inner edge up (mark "TOP" up).

Replacement Rings: .010", .020", .030" Oversize.

CONNECTING ROD BEARINGS: Precision type steel-backed, babbitt-lined. **NOTE:** Bearing cap bolts forged integrally with connecting rod.

Clearance—.0015-.003". Sideplay .0175".

Replacement Bearings: Furnished .001", .010", .020" Undersize.

Installing Rods: Marks (number) on rod and cap together and on same side of engine as mark on bottom of crankcase.

CRANKSHAFT BEARINGS: Removable steel-backed, babbitt lined. No shims. **NOTE:** Top and bottom halves not interchangeable (oil hole in top). Bearing caps numbered 1 to 5 on distributor (left) side.

Clearance—.0015-.003". Endplay .003-.010" (#5).
Replacement Bearings: Furnished .001", .010", .020" Undersize.

CAMSHAFT SETTING: Overhead camshaft driven by bevel gears through "tower shaft" at front of engine. For correct valve timing with camshaft out of engine, proceed as follows:

1) Turn engine over slowly until the following three conditions occur simultaneously: a) Top dead center mark on flywheel is in center of inspection hole in right front face of housing, b) Distributor rotor points toward #1 cylinder segment in distributor cap, c) Punch-marked tooth of upper tower gear (see below) points toward rear of engine and is in line with center-line of camshaft bearings.

2) With engine positioned as above, assemble the camshaft, pushing the oil metering housing into upper tower shaft gear and meshing punch-marked

tooth of upper tower shaft gear between two punch-marked teeth of camshaft gear. Complete camshaft assembly by installing bearing caps.

3) Turn engine over slowly by hand for at least two revolutions.

ENGINE ASSEMBLY NOTE: If engine completely disassembled, install and mesh all gears of the valve system exactly as follows:

Crankshaft Gear: Install gear with marked spline on crankshaft between two punch-marked teeth on gear.

Tower Shaft Lower Gear: Gear is integral with shaft. The two punch-marked teeth on tower gear should straddle punch-marked tooth on crankshaft gear.

Tower Shaft Upper Gear: Install gear on shaft with punch marks in line. Mesh punch-marked tooth on gear between two punch-marked teeth of camshaft gear.

Camshaft Gear: Gear is keyed on shaft.

NOTE: Oil for pressure lubrication of camshaft bearings flows through tower gear to hollow camshaft. Oil fitting at upper end of tower gear shaft must be correctly installed.

VALVES: Head Diam. Seat Angle Stem Clearance
Intake1.171".....45°......0025-.004"
Exhaust1.046".....45°......0025-.004"
Valve Spring Pressure: 28 lbs. at 1¼" (valve closed), 48 lbs at 1 7/32" (valve open).

VALVE TIMING

Valve Timing Check: See Camshaft Setting (above) for correct installation of valve drive system. No. 1 intake valve opens 5° BTDC and No. 1 exhaust valve closes 5° ATDC (Flywheel marked at TDC only).

LUBRICATION & COOLING

LUBRICATION: Crankcase Capacity—3 qts. (4 qts. with Optl. Oil Filter—drain filter when oil changed).
Normal Oil Pressure: 40-50 lbs. at 30 MPH.

COOLING: Capacity—5 qts.

Pump Alignment Note: Pump and generator must be aligned to prevent excessive pump bushing wear. To align, install pump (bolts finger tight), install alignment fixture No. 206293 in place of generator, tighten generator bracket attaching bolts, tighten water pump attaching bolts. Remove fixture and install generator. Do not loosen generator bracket attaching bolts.

Thermostat: In engine outlet. Opens at 170°F.

MECHANICAL

CLUTCH: Rockford. Single plate, dry disc type.

Pedal Adjustment: Pedal free movement 1". Adjust throw-out cable length by screwing clevis in or out on cable end.

Facings: Molded. I.D. 4", O.D. 6". Thickness 7/64" front (flywheel) side, 9/64" rear (pressure plate) side.

FRONT SUSPENSION: Conventional (semi-elliptic springs). See Specification Table on Page 38.

BRAKES: Hawley. Four-wheel, mechanical type. Hand lever applies all four service brakes.

Clearance—.010" both ends of each shoe (adjusting screw backed off ¼ turn from 'drag' point).

Drum Diameter—6".

Lining: Molded. Width 63/64". Thickness 5/32". Length per wheel 16".

HOOD LOCK: Same as on Chrysler Six C-38.

MODEL IDENTIFICATION

	Model	Serial No.
Custom	S-11C	5,784,001
Deluxe	S-11S	6,154,001
Taxicab	S-11	5,102,501

SERIAL NUMBER: See model notation (above) for first numbers. Stamped on plate on right front door body hinge post.

ENGINE NUMBER: First no. S-11-, S-11C-, or S-11S-1001. Stamped on boss on left side of block between #1 and #2 cylinders.

TUNE-UP

COMPRESSION: Pressure—125-135 lbs. at cranking speed of 125 RPM. (Std. 6.6-1 Cast Iron Head).

VACUUM READING: Steady 18-21" idling at 6 MPH.

FIRING ORDER: 1-5-3-6-2-4.

SPARK PLUGS: Auto-Lite Type A5. 14 mm. Metric. Gaps—.025"

IGNITION: See Coil, Condenser, and Distributor.

Breaker Gap—.020" Cam Angle—38° (closed).

Breaker Arm Spring Tension—17-20 ozs.

Rotation—Clockwise viewed from above.

Automatic Advance—Starts at 350 RPM., 3° at 400 RPM. Maximum advance 11° at 1400 RPM (Distributor degrees & RPM).

Vacuum Advance—Starts with 5½" vacuum. Maximum advance 6° (distr.) with 14" vacuum.

IGNITION TIMING: Std. Setting—At TDC.

Timing Mark—Vibration Dampener marked "DC" at top dead center position with 15-1° graduations before and after this point. Set timing with DC mark at pointer on chain case cover, then set manual (octane selector) adjustment as follows: **Manual (Octane Selector) Adjustment**—Set for slight ping in 10-30 MPH. range when accelerating with wide open throttle. Do not vary initial timing more than 4° advance or retard.

CARBURETION: See Carburetion.

Idle Setting—Set idle adjusting screw for smooth idling with warm engine (idle screw ¾-1¼ turns open), turn screw out for richer mixture. Idle speed 6 MPH. (450-475 Eng. RPM. with Hydraulic Trans.).

Float Level—Top of float (not soldered seam) 5/64" plus or minus 1/64" below top edge of bowl.

Accelerating Pump—Center Hole (med. stroke) Normal. Inner Hole—Summer, Outer Hole—Winter, for extreme temperatures.

Fuel Pump Pressure: 4 lbs. maximum.

MANIFOLD HEAT CONTROL: Automatic thermostatic type. See that valve operates freely. When installing coil, wind free end up approx. one turn.

VALVES: See Valve Timing.

Tappet Clearance—.008" Intake, .010" Exhaust, Hot.

NOTE—Tappet adjusting screws are self-locking

STARTING: See Battery, Starter, Generator, and Regulator.

IGNITION

COIL: Auto-Lite No. IG-4806. Mounted directly above distributor on ignition cable bracket.

Ignition Current—2.25 amperes idling, 5 stopped.

CONDENSER: Auto-Lite Part No. IG-3927A.

Capacity—.25-.28 microfarad.

DISTRIBUTOR: Auto-Lite No. IGS-4208-1. Full automatic advance type with auxiliary vacuum spark control and manual (octane selector) adjustment. See Tune-Up for distributor specifications.

IGNITION TIMING: See Tune-Up for settings.

CARBURETION

CARBURETOR: Carter (Ball & Ball) Model EX1 (Std.), Model EV1 (With Fluid Drive & Automatic Trans.). 1½" Single Barrel, downdraft types. **NOTE** Model EV1 has Slow-Closing Throttle and Step-down Switch unit for transmission control.

See Tune-Up for carburetor adjustment directions.

Main Metering Jet—No. 159-89S—312-316 cc. per minute (All models).

FAST IDLE: Operated by choke lever. No adjustment

SLOW-CLOSING THROTTLE (EV1): Electro-magnetic type. No adjustment required.

AUTOMATIC CHOKE: Sisson. Adjust by inserting gauge pin through hole in automatic choke lever shaft and slot in base mounting flange (to position shaft) and adjusting carburetor choke valve lever so that choke valve is closed tightly.

AIR CLEANER: AC. Heavy Duty Oil-bath type.

Servicing—Clean filter element in kerosene, clean out oil reservoir and fill to indicated level with SAE No. 50 engine oil (above 32°F., approx. 1 pint required). Service cleaner whenever sump is half filled with oil and dust sludge. **NOTE**—Crankcase ventilator air cleaner in oil filler cap should be cleaned in kerosene and re-oiled by dipping in SAE No. 50 engine oil at 1000 mile intervals.

FUEL TANK FILTER: New self-cleaning type porous bronze filtering element located in fuel tank. No servicing required (drain tank yearly).

FUEL PUMP: AC. Type AT, Pump Exch. No. 505 (First Cars), Carter Type M594S (Later Cars). Diaphragm type fuel pump. Pressure—4 lbs maximum.

ELECTRICAL

BATTERY: Willard Type. 6 volt, 17 plate, 110 Ampere Hour capacity (20 hour rate).

Grounded Terminal—Positive (+) terminal.

Location—In engine compartment on left side.

STARTER: Auto-Lite MAW-4025. Arm. # MAW-2030.

Drive—Solenoid pinion shift (overrunning clutch).

Rotation—Counter-clockwise at commutator end.

Brush Spring Tension—42-53 ozs. (new brushes).

Cranking Engine—125 RPM., 175 amperes, 5.4 volts.

Performance Data

Torque	R.P.M.	Volts	Amperes
0 ft. lbs.	4900	5.5	65
11.55 "	110	3.5	500
18.0 "	Lock	4.0	670

All other electrical units and specifications (Generator, Regulator, Lighting, Lighting Circuit Breaker, and Fuses) are same as for Chrysler Six. See Chrysler Six Model C-38 article (preceding) for data.

ENGINE

ENGINE SPECIFICATIONS: Six cylinder, "L" Head.

Bore—3 7/16" **Stroke**—4¼"

Displacement—236.6 cu. ins. **Rated H.P.**—28.36

Developed Horsepower—115 at 3800 RPM.

Compression Ratio—6.6-1 Std. Cast Iron Head.

Other engine specifications except Valves (below) are same as for Chrysler Eight. See Chrysler Eight C-39 & C-40 article (preceding) for specifications and service data on Pistons, Rings, Pins, Connecting Rod Bearings, Crankshaft Bearings, and Camshaft Setting.

VALVES: Head Diam. Seat Angle Stem Clearance

Intake 1 23/32" 45°0015-.0035"

Exhaust 1 17/32" 45°002-.004"

Valve Spring Pressure—40-50 lbs. at 1¾" (closed), 107-115 lbs. at 1¾" (open). Free length 2".

VALVE TIMING

Valve Timing Check—With .014" (cold) tappet clearance, #6 intake valve opens 12° BTDC. with 12th graduation before "DC" mark on dampener at pointer on chain case cover. Reset tappet clearance at .008" with engine hot.

LUBRICATION & COOLING

LUBRICATION: Crankcase Capacity—5 qts.

Normal Oil Pressure—30-45 lbs. at 30 MPH.

Oil Filter—Replace filter cartridge at 8000 mile intervals or more often if required.

COOLING: Capacity—18 qts.

Thermostat—In cylinder head outlet. Starts to open at 157-162°F. Fully open at 183-187°F.

MECHANICAL

CLUTCH: Borg & Beck Model 10A7 (Std.), 9A7 (With Fluid Drive & Tip-Toe Shift Transmission), 11A6 (Taxicab). Single plate, dry disc type. **NOTE**—Cover Assy. marked #952 (9A7), 957 (10A7), 931 (11A6). **Pedal Adjustment**—Set pedal to just clear toeboard (adjust stop screw on lower end of pedal), and for 1" free travel (adjust nut on connector link at release fork. **CAUTION**—Do not disturb turnbuckle on clutch pedal rod (controls setting of over-center spring which does not require adjustment unless setting disturbed).

Facings	Woven type.	I.D.	O.D.	Thickness
9A7	6"	9¼"	1/8"
10A7	7"	10"	1/8"
11A6	6½"	11"	1/8"

TIP-TOE SHIFT TRANSMISSION: Optl. with Fluid Drive. New design semi-automatic, four-speed transmission with hydraulic actuation and electrical (governor switch and throttle "kick-down" switch) control. Transmission has "Low Range" and "High Range" controlled by Shift Lever on steering column and two speeds within each range (First & Second in Low Range, Third and Fourth or Direct Speed in High Range) engaged automatically by the hydraulic shift mechanism. Automatic shifting is dependent on car speed and throttle position and occurs as follows:

Automatic Upshift & Downshift—Shifts up from First to Second at 6-7 MPH. (Low Range), or from Third to Fourth (Direct Speed) at 12-14 MPH. (High Range) when throttle released momentarily. Shifts down at approximately the same speeds (Ignition Interrupter grounds coil and interrupts ignition momentarily to permit downshift, this interruption not required for upshift).

Accelerator Pedal Kick-down—Shifts down from Fourth to Third at speeds under approx. 53 MPH. (High Range) and from Second to First at speeds under approx. 27 MPH (Low Range) when accelerator pedal is fully depressed. Kick-down cannot be secured at higher speeds (kick-down switch on carburetor inoperative at higher speeds).

Lubrication: Check the oil level in the transmission case every 1000 miles or 30 days, drain and refill with new oil every 10,000 miles or yearly. To check oil level, remove plug on right front side of case (to rear of lower transmission mounting bolt), maintain oil level even with bottom of filler plug hole. **CAUTION**—Clean magnetic plug (drain plug) and oil pump screen (under cover on lower left rear corner of transmission case) when transmission case

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drained. Use extreme care to keep dirt out of transmission.

Recommended Lubricant—Use only No. 10-W engine oil in this transmission. Capacity 3 pints.

To Start Car by Pushing or Towing: Turn on ignition, place shifter lever in "High Range" position. When car speed reaches 15 MPH, disengage clutch momentarily (to allow transmission to shift to Fourth Speed which is not free-wheeling), re-engage clutch and continue to move car until engine starts.

Control Units: Oil Pump—Pump is "Gerotor" type (same as engine oil pump) located under rear cover plate in transmission case and is driven from the mainshaft (operates whenever rear wheels are turning). Pressure should be 40 lbs. to approx. 60 lbs. at 15 MPH. (pressure drops when upshift starts). To check oil pressure, remove upper plug on right side of mainshaft rear bearing retainer case (directly below hand brake bracket), connect gauge at this point, jack up rear wheels securely and run engine with transmission in gear. **CAUTION**—If pump operation unsatisfactory, check oil level in case and clean oil screen (see Lubrication).

Pilot Valve Solenoid—Auto-Lite No. SSS-4002. Solenoid pushes pilot valve down when energized. Pilot valve should be in upper position with solenoid inactive or removed and should move freely.

Control Relay—Auto-Lite No. HRM-4102. Relay has two sets of contacts which open and close together (contacts closed when relay coil energized). Fuse on relay is 30 ampere capacity.

Governor Switch—Auto-Lite No. TG-4202R or TG-4203R. Governor contacts are closed (completing circuit to ground) with car at rest and are opened by action of the centrifugal weights at a car speed of 6-7 MPH (Low Range), 12-14 MPH (High Range).

Accelerator Pedal Kick-down Switch—Built in the carburetor. Operates in same manner as on 1942 models. See Carter (B&B) Carburetor article in Carburetor Section of manual.

GYROL FLUID DRIVE: Optl. (with Tip-Toe Shift Transmission). Hydraulic coupling on flywheel.

Servicing—Check fluid level at end of first 1000 miles and at 10,000 mile intervals thereafter. Maintain fluid level at filler plug hole height (use only Mopar Fluid Drive Fluid).

FRONT SUSPENSION: Independent parallelogram type with coil springs. See *Specification Table Page 38*.

BRAKES: Lockheed Hydraulic Two Cylinder Type (Front Wheels), Double Anchor Type (Rear Wheels). Hand lever applies independent shaft brake.

Clearance—.006" at each end of each shoe.

Drum Diameter—11"

Lining—Molded type. Width 2". Thickness 13/64". Length per wheel 23" (front), 20 3/8" (rear).

Hand Brake: Independent type with brake drum mounted on drive shaft at rear of transmission.

Drum Diameter—6"

Lining—Width 2". Thickness 5/32". Length 16 11/16"

Adjustment—.015-.020" clearance around band. Adjust anchor screw for clearance at this point, adjust guide bolt adjusting nut for clearance at lower end of band, adjust large adjusting bolt nut (at lower end of bolt) for clearance at upper end of band.

DODGE

HOOD LOCK: Conventional center hinge hood. Lock operated by button under each end of instrument panel. Unlock hood by pulling button on same side.

MODEL IDENTIFICATION

SERIAL NUMBER: On right front door hinge post. First number 30,645,001.

ENGINE NUMBER: On boss on left side of engine between #1 and #2 cylinders. First No. D24-1001.

TUNE-UP

COMPRESSION: Pressure—160-170 lbs. at 1000 RPM. or 125-135 lbs. at cranking speed of 125 RPM.

VACUUM READING: Steady 18-21" idling at 6 MPH.

FIRING ORDER: 1-5-3-6-2-4.

SPARK PLUGS: Auto-Lite Type A-5. 14 mm. Metric. Gaps—.025".

IGNITION: See Coil, Condenser, and Distributor.

Breaker Gap—.020" Cam Angle—38° Closed.

Breaker Arm Spring Tension—17-20 ounces.

Rotation—Clockwise viewed from above.

Automatic Advance—Starts 350 RPM., 3° at 400 RPM., 10° max. at 1150 RPM. (IGS-4207A-1 distr.—U.S.), 12° max. at 1750 RPM (IGS-4208B-1 Can.).

Vacuum Advance—Starts with 5" of vacuum, 8.5° max. with 16" of vacuum (U.S.—IGS-4207A-1), 7° max. with 15" of vacuum (Canada—IGS-4208B-1).

IGNITION TIMING: Std. Setting—2° ATDC.

Timing Mark—Second graduation after "DC" mark on vibration dampener aligned with pointer on chain case cover. Vary as follows:

Octane Selector—Set for slight ping when accelerating with wide open throttle between 10-30 MPH.

CARBURETION: See Carburetion.

Idle Setting—With engine warm, set throttle stop-screw for 6 MPH. idle speed. Adjust idle adjusting screw for smooth idle. Reset idle speed.

Float Level—Fuel level 5/8" below top edge of bowl.

Accelerating Pump—Center hole (medium) Normal. Inner Hole—Summer, Outer Hole—Winter.

Fuel Pump Pressure: 4 lbs. maximum.

MANIFOLD HEAT CONTROL: Thermostatic coil type. See that valve operates freely. When installing coil, wind free end up approx. one turn.

VALVES: See Valve Timing.

Tappet Clearance—.008" Intake, .010" Exh., Hot.

STARTING: See Battery, Starter, Generator, and Regulator.

IGNITION

COIL: Auto-Lite No. IG-4806. Mounted above distributor on mounting bracket.

Ignition Current—2 1/4 amperes idling, 5 1/2 stopped.

CONDENSER: Auto-Lite Part No. IG-3927A.

Capacity—.25-.28 microfarad.

DISTRIBUTOR: Auto-Lite Model IGS-4207A (U.S.), IGS-4208B-1 (Canada). Automatic advance type with Vacuum Spark Control and Octane Selector. See *Tune-Up for distributor specifications*.

IGNITION TIMING: See *Tune-Up for settings*.

CARBURETION

CARBURETOR: Stromberg Model BXV-3 (Standard), BXVD-3 (Cars with Fluid Drive). 1 1/2" single barrel, downdraft type with Sisson automatic choke.

NOTE—Slow-closing throttle ("dash-pot") used on Model BXVD-3 carburetors (cars with Fluid Drive).

See *Tune-Up for carburetor adjustment directions*.

Metering Jet—Part No. P-19442 (.061").

FAST IDLE: Setting—Not adjustable. Throttle stop-screw should be on high point of fast idle cam with choke valve closed.

SLOW CLOSING THROTTLE: Dash-pot Setting—With all slack removed from linkage, set adjusting screw on dash-pot control lever so that piston travel is 5/16-11/32". Turn screw in to shorten stroke.

AUTOMATIC CHOKE: Sisson. Adjust by inserting gauge pin through hole in automatic choke lever shaft and slot in base mounting flange (to position shaft) and adjusting carburetor choke valve lever so that choke valve is tightly closed.

FUEL TANK FILTER: New self-cleaning type porous bronze filtering element located in fuel tank. No servicing required (drain tank yearly).

AIR CLEANER: AC heavy duty Oil-bath type.

Servicing—Clean and refill to indicated oil level at 1000 mile or 30 day intervals. Use SAE 50 oil (above 32°F.), SAE 20-W (below 32°F.). Oil filler cap filter should be cleaned in kerosene and re-oiled by dipping in SAE 50 engine oil at the same time.

FUEL PUMP: AC type AT. Exchange No. 505. Diaphragm type fuel pump.

Pressure—4 lbs. maximum.

ELECTRICAL

BATTERY: Auto-Lite CF-1-15R. 15 plate, 105 Amp. Hr. Grounded Terminal—Positive (+) to engine.

Location—Under hood on left side of car.

STARTER: Auto-Lite MAW-4041. Arm. No. MAW-2030.

Drive—Outboard Barrel type Bendix No. A-2089.

Rotation—Counter-clockwise at commutator end.

Brush Spring Tension—42-53 ozs. (new brushes).

Cranking Engine—125 RPM., 175 amperes, 5.4 volts.

Performance Data			
Torque	R.P.M.	Volts	Amperes
0 ft. lbs.	4900	5.5	65
11.55 "	110	3.5	500
18.0 "	Lock	4.0	670

All other electrical units and specifications (Generator, Regulator, Lighting, Lighting Circuit Breaker, and Fuses) are same as for Chrysler Six. See Chrysler Six Model C-38 article (preceding) for data.

ENGINE

ENGINE SPECIFICATIONS: 6 cylinder, "L" head type.

Bore—3 1/4". **Stroke**—4 5/8".

Displacement—230.2 cubic inches. **Rated HP**—30.2.

Developed Horsepower—105 at 3600 RPM.

Compression Ratio—6.70-1 Std. cast-iron head.

PISTONS: 4-ring, aluminum alloy, split skirt, steel strut, cam ground type. Length—3 11/16".

Clearance—Use .0015" x 1/2" feeler on side opposite slot, pull to withdraw feeler should be 10-15 lbs.

Removal—Pistons and rods removed from above.

Replacement Pistons—Std. size, .005", .020", .030", .040", .060" oversize. Semi-finished pistons for bores up to .023" oversize, & .025-.060" oversize.

Installation—Slot away from camshaft.

PISTON RINGS	Width	End Gap	Side Clearance
Comp. (top)	3/32"	.007-.015"	.0025-.0040"
Comp. (#2)	3/32"	.007-.015"	.0020-.0035"
Oil Control	5/32"	.007-.015"	.0010-.0025"

NOTE—Install upper compression rings with relief on inner diameter UP.

Replacements Rings—Std. size, .005", .020", .030", .040", .050", .060" oversize.

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PISTON PIN: Floating type. Rod hole bronze bushed. Clearance—Thumb press fit at 160°F. in piston, tight thumb push fit at 70°F. in rod bushing.

Replacement Pins—Furnished standard size and .0006", .003", and .008" oversize.

CONNECTING ROD BEARINGS: Replaceable precision type. No shims.

Clearance—.001-.0015". Sideplay—.0055-.0115".

Replacement Bearings—Furnished standard size and .001", .002", .010", and .012" undersize.

Rod Installation—Wide portion of bearing to rear (#1, 3, 5), to front (#2, 4, 6). Oil hole to camshaft.

CRANKSHAFT BEARINGS: Replaceable precision type. No shims.

Clearance—.001-.0015". Endplay—.003-.007" (rear).

Replacement Bearings—Same sizes as for rods

CAMSHAFT SETTING: Sprockets marked. Mesh chain with sprockets turned so that "0" marks are adjacent and in line with shaft centers.

VALVES: Head Diam. Seat Angle Stem Clearance

Intake1 17/32".....45°......001-.003"

Exhaust1 13/32".....45°......003-.005"

Valve Spring Pressure—40-45 lbs. at 1 3/4" (valve closed), 107-115 lbs. at 1 3/8" (valve open).

VALVE TIMING

Valve Timing Check—With .014" cold tappet clearance, #1 intake valve opens 12° BTDC. (piston .065" BTDC.) with 12th graduation before "DC" mark on vibration dampener in line with indicator on chain cover. Reset tappet clearance .008" Intake Hot.

LUBRICATION & COOLING

LUBRICATION: Crankcase Capacity—5 quarts.

Normal Oil Pressure—30-45 lbs. above 30 MPH.

Oil Filter—Replace every 8000 miles.

COOLING: Capacity—15 quarts.

Thermostat—In outlet elbow on cylinder head. Bypass type. Starts to open 157-162°F.

MECHANICAL

CLUTCH: Borg & Beck 10A7 (Std.), 9A7 (with Fluid Drive), 11A6 (Taxi). Single plate, dry disc types.

Facings—Woven type. I.D. O.D. Thickness

9A76".....9 1/4".....1/8"

10A77".....10".....1/8"

11A66 1/2".....11".....1/8"

Pedal Adjustment—Set pedal to just clear toeboard (stopscrew on lower end of pedal) and set for 1" free travel (adjust nut on connector link at fork).

CAUTION—Do not disturb turnbuckle on clutch pedal rod (controls setting of over-center spring (requires adjustment only when setting disturbed)).

FLUID DRIVE: Optl. Hydraulic coupling.

Servicing—Same as DeSoto (see DeSoto article).

FRONT SUSPENSION: Independent parallelogram type with coil springs. See Specification Table Page 38.

BRAKES: Lockheed Hydraulic Two-Cylinder type (Front), Double Anchor type (Rear). Hand lever applies independent shaft brake.

Clearance—.006" at each end of each shoe.

Drum Diameter—11" cast-iron type.

Lining—Molded asbestos. Width 2". Thick. 13/64". Length per wheel: Front 23", Rear 20 3/8".

Hand Brake: Independent shaft brake. All specifications and adjustments same as DeSoto except as noted below. See DeSoto article for data.

Lining—Length 7 7/8" (2 pieces). Thickness 5/32". Width 2".

FORD 6

HOOD LOCK: Alligator type hood—same as V8.

MODEL IDENTIFICATION

PASSENGER CARS

6GA Deluxe & Super Deluxe

TRUCKS

Model	Wheelbase
6GC Comm'l	114"
6GY Tonner	122"
6GT, 6GU Dump Truck Chassis.....	134"
6G8T	158"

SERIAL & ENGINE NUMBER: Stamped on top of clutch housing (visible through opening in floor) and on left frame side member near front engine support.

TUNE-UP

COMPRESSION: Pressure—105-125 lbs. at cranking speed of 100 RPM. (Std. 6.7-1 Cast Iron Head).

VACUUM READING: Approx. 18-20" at idling speed.

FIRING ORDER: 1-5-3-6-2-4.

SPARK PLUGS: Champion H-10 (Pass. Cars), H-9 Comm'l (Trucks). 14 mm, Metric type.

Gaps—.030-.034"

IGNITION: See Coil, Condenser, and Distributor.

Breaker Gap—.014-.016". Cam Angle 40° closed.

Rotation—Clockwise viewed from drive end (distributor off engine).

Breaker Arm Spring Tension—20-24 ozs.

Automatic Advance—Starts at 200 RPM. Maximum 11-12° at 600 RPM (Distr. degrees and RPM).

IGNITION TIMING: Std. Setting—2° BTDC.

Timing Mark—No flywheel marks provided. Distributor should be set at 1° on Stroboscope for correct 2° (flywheel degree) timing on engine.

Vacuum Brake Setting—Set to just eliminate ping-pong when engine operated under load (back off adjusting screw until engine pings, then turn screw in just enough to eliminate ping).

CARBURETION: See Carburetion.

Idle Setting—Idle screw set for smooth idle and highest steady reading of vacuum gauge (when used). Idle speed 350 Engine RPM.

Float Level—Fuel level 11/16" (21/32-23/32") below top edge of bowl.

Accelerating Pump—Center (#2) hole Normal. Inner (#1) hole—Summer, Outer (#3) hole—Winter for temperature extremes.

Fuel Pump Pressure: 3 1/2 lbs. (2-3 1/4 lbs.).

MANIFOLD HEAT CONTROL: Automatic thermostatic type. Valve should be closed (counterweight arm against stop pin) with engine cold and should operate freely.

VALVES: See Valve Timing.

Tappet Clearance—.013-.015" Intake & Exhaust, Cold. No adjustment provided.

STARTING: See Battery, Starter, Generator, and Regulator.

IGNITION

COIL: Ford No. 1GA-12024. Mounted on engine.

Resistor Unit—Connected in coil primary circuit (part of Lighting Circuit Breaker Assembly).

Ignition Current—4 1/2-6 amperes with engine stopped (primary resistance 1-1 1/2 ohms).

CONDENSER: Ford Part No. 1GA-12300-B.

Capacity—.29-.32 microfarad.

DISTRIBUTOR: Ford No. 5GA-12127 (less Terminal Housing & Rotor). New "Sealed-dry" type. Single breaker, 6 lobe cam, full automatic advance type with Vacuum Brake adjustment.

See Tune-Up for distributor specifications.

IGNITION TIMING: See Tune-Up for settings.

CARBURETION

CARBURETOR: Holley (Chandler-Groves) Ford No. 5GA-9510-A. Single barrel downdraft type.

See Tune-Up for carburetor adjustment directions.

Metering Jet—Ford No. 5GA-9533-A (.065") or 5GA-9533-B (.063")—one used.

FAST IDLE—Operated by choke valve lever. No adjustment required.

AIR CLEANER: Ford No. 1GA-9600-C. Oil bath type.

Servicing—Clean and refill with same grade engine oil used in crankcase (to level mark on case) at 3500 mile intervals or when crankcase drained, or more often if required. NOTE—Clean and re-oil filter element in oil filler cap every 1000 miles.

FUEL PUMP: AC Type R, Ford No. 1GA-9350. Diaphragm type. Pressure—3 1/2 lbs. max. (2-3 1/4 lbs.).

ELECTRICAL

All Electrical Equipment and specifications same as for Ford V8 models (see following article) except as noted below:

GENERATOR: Ford No. 2GA-10000-A. Armature 2GA-10005. Two brush (shunt) type with voltage-current regulation. Ventilated by fan on drive pulley.

Maximum Charging Rate—30 amperes at 7.0 volts.

Performance Data

Amperes	Engine RPM
Start	565
30	1160
30	2500

Rotation—Counter-clockwise at commutator end.

Brush Spring Tension—Approx. 28 ozs.

Field Current—2.08 amperes at 6.0 volts (field resistance 2.88 ohms at 70°F).

Belt Adjustment—1/2" deflection midway between pulleys (generator and fan belts). Adjust both belts by loosening generator mounting screws and swinging generator up and out in line with mounting screw slots.

ENGINE

ENGINE SPECIFICATIONS: Own "90". Six cylinder, "L" head type.

Bore—3.30". Stroke—4.40"

Displacement—236 cu.ins. Rated H.P.—26.13

Developed Horsepower—90 at 3300 RPM.

Compression Ratio—6.7-1 Std. Cast Iron Head.

PISTONS: New four-ring, aluminum alloy, cam-ground, dome head type. Pistons have additional oil ring below piston pin.

Weight—414 grams (stripped), 576 grams (complete)

Removal—Pistons and rods removed from above.

Clearance—Fit pistons with 1/2" feeler stock. Pull required to withdraw .003" thick feeler should be 6-10 lbs.

Replacement Pistons—Standard and .005", .020", .030", .040", .060" Oversize.

PISTON RINGS: Width End Gap Side Clearance

Compr. (#1)092-.0925".....012-.017".....0015-.003"

Compr. (#2)092-.0925".....012-.017".....001-.0025"

Oil (#3,4)186-.1865".....012-.017".....001-.0025"

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Replacement Rings—Standard and .020", .030", .040", .060" Oversize. NOTE—"Steel Section" type rings also furnished .015" and .045" Oversize.

PISTON PIN: Floating type (locking ring each end). Clearance—.0002-.0005" in rod bushing (pin should fall through hole slowly of own weight), .0001-.0002" in piston (light hand push fit with piston at 70°F). **Replacement Pins**—Standard and .001", .002" Oversize; also .002" Undersize.

CONNECTING ROD BEARINGS: Removable, steel-backed, special alloy lined type, locked in rod and bearing cap (tang on bearing engage groove in rod and cap).

Clearance—.001-.003"

Replacement Bearings—Standard and .002", .010", .012", .020", .030" Undersize.

CRANKSHAFT BEARINGS: Removable, steel-backed, special alloy lined type. No shims.

Clearance—.001-.003". Endplay .002-.006" (#4).

Replacement Bearings—Standard and .001", .002", .005", .010", .012", .020", .030" Undersize.

NOTE—Upper and lower bearing halves not interchangeable.

CAMSHAFT SETTING: Mesh marked tooth of crankshaft gear with marked space of camshaft gear (camshaft gear bolt holes offset to insure correct installation).

VALVES: Head Diam. Seat Angle Stem Clearance
Intake 1.620" 45° 0015-.0035"
Exhaust 1.484" 45° 0015-.0035"
Valve Spring Pressure—37-40 lbs. at 2.13" (closed), 76-80 lbs. at 1.84" (open). Replace springs if pressure less than 30 lbs. compressed to 2.125".

VALVE TIMING

Valve Timing Check—No flywheel marks provided. Intake valve opens 3° BTDC. or approx. 1 flywheel tooth before TDC position.

LUBRICATION & COOLING

LUBRICATION: Crankcase Capacity—5 qts.

Normal Oil Pressure—30 lbs. at 2000 RPM.

Oil Filter—Replace filter cartridge at 5000 mile intervals (Ford No. 01A-18662-A).

COOLING: Capacity—15 qts. (Pass. Cars), 16¾ qts. (Comm'l, Tonner), 17¼ qts. (Other Trucks).

Pressure Valve—In filler cap. Opens at 3½-4½ lbs.

Thermostat—In cylinder head outlet, dual valve type with by-pass to water pump for circulation through engine with main valve closed. Starts to open at 150-155°F. Fully open at 170°F.

MECHANICAL

All Mechanical data (Clutch, Front Suspension, Brakes) same as for corresponding Ford V8 models. See following article for data.

FORD V8 & MERCURY

HOOD LOCK: Hood is Alligator type hinged at cowl. To raise hood (Pass. Cars), pull out release knob under instrument panel, release safety catch under front edge of hood.

MODEL IDENTIFICATION

PASSENGER CARS

Ford V8 69A Deluxe & Super Deluxe
Mercury 69M Passenger Cars

TRUCKS

Model	Wheelbase
69C Comm'l	114"
69Y Tonner	122"
69T, 69U Dump Trk., 69W Cab-over-Engine	134"
698T, 698W Cab-over-Engine	158"
694T School Bus Chassis	194"
691W Cab-over-Engine	101"

SERIAL & ENGINE NUMBER: Stamped on top of clutch housing (visible through hole in floor) and on left frame side member near front eng. support.

TUNE-UP

COMPRESSION: Pressure—105-125 lbs. at cranking speed of 100 RPM. (Std. 6.75-1 Cast Iron Head).

VACUUM READING: Steady 18-20" idling at 5-7 MPH.

FIRING ORDER: 1-5-4-8-6-3-7-2 (Cyl. Nos. 1-2-3-4 Right Bank, 5-6-7-8 Left Bank, front-to-rear).

SPARK PLUGS: Champion Type H-10 (Pass. Cars), H9 Comm'l (Trucks). 14 mm. Metric type. Gaps—.025" (Pass. Cars), .030" (Trucks).

IGNITION: See Coil, Condenser, and Distributor. Breaker Gap—.014-.016" (both sets).

Cam Angle—36° (both sets operating together).

Breaker Arm Spring Tension—20-24 ozs.

Rotation—Clockwise viewed from drive end (distributor off engine).

Automatic Advance—Starts at 200 RPM. Maximum 11° at 600 RPM (Distr. degrees & RPM).

IGNITION TIMING: Std. Setting—4° BTDC.

Timing Mark—No flywheel marks provided. Distributor should be set at 2° on Stroboscope, or with distributor off engine, place a scale against the tang on drive end of distributor shaft (on wide side of shaft) and rotate shaft until edge of the scale is exactly ¾" from nearest side of small mounting hole (left hand hole facing drive end of distributor), loosen adjusting screw on right hand side of distributor and move screw in slot until left hand (timing) contacts begin to open, tighten adjusting screw. This setting will give correct 4° BTDC timing when distributor installed on engine.

Vacuum Brake Setting—Set to just eliminate ping-pong when engine operated under load (back off screw until engine pings, then turn screw in until ping is eliminated).

CARBURETION: See Carburetion.

Idle Setting—Both idle screws ⅝-¾ turn open and set for smooth idle and highest steady reading of vacuum gauge (when used). Idle speed 500 RPM or 5-7 MPH.

Float Level—Fuel level 11/16" (21/32-23/32") below top edge of bowl.

Accelerating Pump—Center (#2) hole Normal. Inner (#1) hole—Summer, Outer (#3) hole—Winter for temperature extremes.

Fuel Pump Pressure: 3½ lbs. (1½-3½).

MANIFOLD HEAT CONTROL: Automatic thermostatic control type (located in exhaust manifold outlet of left cylinder bank). See that valve operates freely.

VALVES: See Valve Timing.

Tappet Clearance—.010-.012" Intake, .014-.016" Exhaust. No adjustment provided.

STARTING: See Battery, Starter, Generator and Regulator.

IGNITION

COIL: Ford No. 1GA-12024. Mounted separately on left front corner of cylinder block.

Ignition Current—4½-6 amperes with engine stopped (primary resistance 1-1½ ohm).

Resistor Unit—Connected in coil primary circuit (part of Circuit Breaker Assembly 11A-12250A).

CONDENSER: Ford Part No. 1GA-12300-B.

Capacity—.29-.32 microfarad.

DISTRIBUTOR: Ford No. 59A-12127 (less Terminal Housing, Cap & Rotor). New "Single Cap" sealed-dry "V" outlet type. Double breaker, 8 lobe cam, full automatic advance type with Vacuum Brake adjustment. Breaker "loading" and "timing" contacts operate in same manner as on previous V8 models.

See Tune-Up for distributor specifications.

IGNITION TIMING: See Tune-Up for settings.

CARBURETION

CARBURETOR: Holley (Chandler-Groves) Ford No. 59A-9510-A. Dual (double barrel) downdraft type. See Tune-Up for carburetor adjustment directions.

Metering Jets—Ford No. 59A-9533-A (.050") or 59A-9533-B (.049")—two used.

FAST IDLE: Operated by choke valve lever. No adjustment required.

AIR CLEANER: Ford No. 91A-9600-A. Oil-bath type. Servicing—Clean and refill with same grade engine oil used in crankcase (to level mark on case) at 3500 mile intervals or when crankcase drained, or more often if required. NOTE—Clean and re-oil filter element in oil filler cap at 1000 mile intervals.

FUEL PUMP: AC. Type R, Ford No. 11A-9350. Diaphragm type. Pressure—3½ lbs. (1½-3½ lbs.).

ELECTRICAL

BATTERY: Ford No. 01A-10655-A. 6 volt, 17 plate, 120 Ampere Hour Capacity (20 hour rate).

Grounded Terminal—Positive (+) terminal to engine dash (engine ground strap from right rear cylinder head to dash).

Location—In engine compartment on right hand side (exc. C-O-E), under right front seat (C-O-E).

STARTER: Ford No. 18-11002. Armature No. 18-11005.

Drive—Inboard Bendix No. A1472, Ford No. B-11350.

Brush Spring Tension—Approx. 2 lbs.

Rotation—Counter-clockwise at commutator end.

Cranking Engine—100 RPM., 190-215 amperes.

Performance Data

Torque	RPM	Volts	Amperes
4 ft. lbs.	1070	4.6	200
14 "	Lock	3.5	500

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GENERATOR: Ford No. 21A-10000. Armature 01A-10005. Two brush (shunt) type with voltage-current regulation. Ventilated by fan on drive pulley.
Maximum Charging Rate—30 amperes at 7.0 volts.

Performance Data

Amperes	Engine RPM
Start	520
30	1060
30	2500

Rotation—Counter-clockwise at commutator end.

Brush Spring Tension—Approx. 28 ozs.

Field Current—2.1 amperes at 6.0 volts.

Belt Adjustment—Loosen generator mounting bolt nut, raise generator until belt deflection midway between generator and water pump pulleys is 1".

NOTE—Fan driven by separate belt, adjusted in same manner.

REGULATOR: Ford No. 01A-10505-C. Voltage-current type. Mounted on dash.

Relay Closes—6.1-6.3 volts. **Open**—8 amps. max.

Voltage Setting—6.9-7.2 volts at 70-80°F.

Current Setting—30-33 amperes (hot).

Checking & Adjusting—See article in *Electrical Equipment Section on this unit*.

LIGHTING: Headlamps—Ford Sealed Beam type.

Adjustment—Aim upper beam straight ahead (hot spot center 3" below lamp center height at 25').

Lamp Bulbs—See *Specification Table on Page 31*.

LIGHTING CIRCUIT BREAKER: Ford No. 11A-12250-A (exc. Convertibles), 51A-12250-A (Convertible Models). Two vibrating circuit breakers which protect lighting circuits. Contacts open with 50 ampere current and vibrate to limit current flow.

ENGINE

ENGINE SPECIFICATIONS: Own "100". Eight Cylinder, 90° Vee, "L" head type. Cylinder banks and crankcase cast Enbloc.

Bore—3.187". **Stroke**—3.75".

Displacement—239 cu. ins. **Rated H.P.** 32.5

Developed Horsepower—100 at 3800 RPM.

Compression Ratio—6.75-1 Std. Cast Iron Head.

1946 ENGINE SERVICE NOTES: **Cylinder Head**—New type, Part No. 59A-6050-A or -B, is interchangeable right-and-left. May be identified by figures "59A" or "59A-B" on top. Heads have greater valve clearance for new cylinder block (below) and larger water holes for improved cooling (¾" hole at top center and ⅝" hole at center between #2 and #3 cylinders).

Cylinder Head Gasket—New type, Part No. 59A-6051, may be identified by 5/16" round hole instead of blunt cone shaped opening at lower edge between #2 and #3 cylinder bores. *This gasket must be used with new 1946 type Cylinder Head (above).*

Cylinder Block—New type, Part No. 59A-6010-C, with valve ports located .09" farther from center line of block. May be identified by number or by oblong water passages just above valves (round on previous types). *If earlier type Cylinder Heads (81A-, 81T-, 99T-, 29A-) used with this block, heads must be machined out for valve clearance, and water passages in head should be enlarged for improved cooling.*

PISTONS: New four-ring, steel or aluminum alloy, cam ground, dome head type. These pistons have additional oil ring below piston pin.

Weight—370 grams (aluminum) stripped.

Removal—Pistons and rods removed from above.

Clearance—Fit pistons with ½" feeler stock. Pull required to withdraw feeler of correct thickness (see table below) should be 6-10 lbs. for all types.

With Steel Sleeves

Feeler Thickness

	Steel Piston	Aluminum Piston
New Piston & Sleeve .....	.003"	.003"
New Piston—Worn Sleeve .....	.004"	.004"
Worn Piston & Sleeve .....	.005"	.005"
New Piston & Sleeve .....	.0025"	.002"

Engines without Sleeves

New Pistons & Sleeve .....	.0025"	.002"
New Piston—Worn Bore .....	.004"	.004"
Worn Piston & Bore .....	.005"	.005"

Replacement Pistons—Steel pistons furnished Std. and .0025", .005", .015", .020", .030", .040" Oversize; Aluminum pistons Std., .005", .020", .030", .040", .060" Oversize. **NOTE**—On engines with sleeves, sleeve should be replaced and Std. piston installed.

PISTON RINGS: **Width** **End Gap** **Side Clearance**

Compr. (#1) .....	.0915-.092"	.012-.017"	.0015-.003"
Compr. (#2) .....	.0915-.092"	.012-.017"	.001-.0025"
Oil (#3,4) .....	.154-.155"	.012-.017"	.001-.0025"

Replacement Rings—Ring sets furnished Std. and .020", .030", .040", .060" Oversize.

PISTON PIN: Floating type (locking ring each end).

Clearance—.0002-.0005" in rod bushing (pin should fall through hole slowly of own weight), .0003-.0009" (steel pistons), .0001-.0002" (aluminum pistons) or light hand push fit with piston at 70°F.

Replacement Pins—Std. and .001", .002" Oversize.

CONNECTING ROD BEARINGS: Removable (floating), steel-cored, special alloy (Silvaloy) lined type.

Clearance—.0015-.0035". Replace bearings if less than .1085" thick, replace or hone rod for oversize bearing if worn more than .0015" over original size of 2.3597-2.3603" (both rods must be same size).

Sideplay—Bearing endplay .003-.007". Total side clearance for both rods .006-.014".

Replacement Bearings—Furnished Std. size and .002" Undersize (for Std. Rod), .010" Undersize (for Std. and .008" Oversize rod), .020" Undersize (for Std. Rod).

Installing Rods—Rods and bearing caps marked "R" (right bank), "L" (left bank) and with cylinder number. Install rods and caps with numbers together in same numbered cylinder with marks toward front of engine.

CRANKSHAFT BEARINGS: Removable, steel-backed, special alloy lined type.

Clearance—.001-.003". **Endplay** .002-.006". (#3).

Replacement Bearings—Std. size and .010", .015", .020" Undersize (Front & Center), Std. size and .002", .005", .010", .012", .020", .030" Undersize (Rear Bearing). Rear main bearing also furnished Undersize (between flanges) and Oversize (in length) for endplay adjustment.

CAMSHAFT SETTING: Mesh marked tooth of crankshaft gear with marked space of camshaft gear (camshaft gear bolt holes offset to insure correct installation).

VALVES: **Head Diam.** **Seat Angle** **Stem Clearance**
Intake1.510".....45°......0015-.0035"
Exhaust1.510".....45°......0025-.0045"
Valve Spring Pressure—37-40 lbs. at 2.13" (closed), 76-80 lbs. at 1.84" (open). Replace if pressure less than 30 lbs. when compressed to 2.125".

VALVE TIMING

Valve Timing Check—No flywheel marks provided. Intake valve opens with piston on top dead center.

LUBRICATION & COOLING

LUBRICATION: Crankcase Capacity—5 qts.

Normal Oil Pressure—50 lbs. (Ford), 30 lbs. (Mercury) at 2000 RPM. **NOTE**—New type oil pump has pressure regulator built in pump housing.

Oil Filter—Replace filter cartridge at 5000 mile intervals. Ford No. 01A-18662-A (except Cab-over-Engine), 11W-18662-B (Cab-over-Engine).

COOLING: Capacity—22 qts. (Pass. Cars, Comm'l., Tonner), 23 qts. (Trucks).

Pressure Valve—In filler cap. Opens at 3½-4½ lbs. **Thermostat**—In each cylinder head outlet. Starts to open 150-155°F. Fully open at 170°F.

MECHANICAL

CLUTCH: Long. Ford Nos. 19A-7563—10" type (Pass. Cars & Comm'l.), 51-7563—11" type (Trucks), 81B-7563 Special 11" Bus type (School Bus). Single plate, dry disc, semi-centrifugal type. **NOTE**—11" Clutch used with all 4-speed transmission installations.

Pedal Adjustment—Pedal free travel 1" (Pass. Cars), 1½" (Trucks). To adjust, remove clevis pin in connector rod at equalizer shaft, adjust clevis on rod.

Facings—Asbestos composition.

10" Clutch—I.D. 6.75". O.D. 10". Thickness .125".

11" Clutch—I.D. 6.5". O.D. 11". Thickness .137".

FRONT SUSPENSION: Conventional "I" beam axle with Reverse Elliott ends and single transverse spring (Pass. Cars), two semi-elliptic springs (Comm'l and Trucks). See *Specification Table on Page 38*.

BRAKES: Service—Ford (Lockheed) Hydraulic, double anchor type. **NOTE**—Passenger car brakes are new self-centering type (no anchor pin adjustmt.).

Clearance—Least possible amount without drag.

Drum Diameter—Pass. Cars & Comm'l.—12" (front & rear); Tonner—12" (front), 14" (rear); Other Trucks—14" (front), 15" (rear).

Lining (Pass. Cars & Comm'l.)— **Length per Shoe** **Width** **Thickness** **Front** **Rear**

Ford	1.735-1.750"	.195-.205"	.13.5"	.10.28"
Mercury	1.705-1.735"	.195-.205"	.13.12"	.10.08"

(All Trucks)

Tonner (Frt)	1.735-1.750"	.195-.205"	.13.5"	.10.28"
Tonner (Rear) .....	.2.0"	.27"	.15.53"	.10.78"
Others (Front) .....	.2.0"	.27"	.15.53"	.10.78"
Others (Rear) .....	.3.5"	.535"	.16.67"	.11.57"

Hand Brake (Pass. Cars & Comm'l.): Hand lever applies rear wheel service brakes (see above).

Hand Brake (Trucks): Independent shaft brake.

Drum Diameter—7.81".

Lining—Width 2.5". Thickness .250". Length 24.6".

Adjustment—Adjust anchor screw and adjusting rod nut for .010" clearance around band. Adjust brake rod clevis so that brake cam flat rests on ear of band with hand lever released.

HOOD LOCK: Hood is Alligator type. To raise hood, pull out on control button under left side of instrument panel, press back on safety catch under lower edge of hood at front end.

MODEL IDENTIFICATION

	Model	First Serial No.
Frazer	F-47	F-47-1001
Kaiser Special	K-100	K-100-1001

KAISER MODEL NOTE: The Kaiser Special is not the Front Wheel Drive model (with Torsion Springing) which is expected to be introduced later.

SERIAL NUMBER: See model notation (above) for First Numbers. Stamped on left front door hinge post between upper and lower hinges.

ENGINE NUMBER: Stamped on boss on upper left corner of cylinder block (below head) between #1 & #2 cylinders and on Engine Nameplate.

TUNE-UP

COMPRESSION: Pressure—135 lbs. at cranking speed
VACUUM READING: 17½" idling at 500 RPM.

FIRING ORDER: 1-5-3-6-2-4.

SPARK PLUGS: Champion Type J-9. 14 mm. Metric. Gaps—.032"

IGNITION: See Coil, Condenser, and Distributor.

Breaker Gap—.020" Cam Angle—38° (closed).

Breaker Arm Spring Tension—17-20 ozs.

Automatic Advance—Maximum 10° at 1700 RPM (Distr. degrees and RPM).

Vacuum Advance—Starts with 8" vacuum. Maximum 7½° (distr.).

IGNITION TIMING: Std. Setting—At TDC.

Timing Mark—Flywheel mark "DC/" at indicator in inspection hole in right front side of clutch housing.

Octane Selector Setting—Set for slight ping when accelerating with wide open throttle.

CARBURETION: See Carburetion.

Idle Setting—Set idle adjusting screw for smooth idle (¾-1¼ turn open, turn screw out for richer mixture). Idle speed 8 MPH.

Float Level—¾" from seam at free end of float to top of projection on float bowl cover with needle valve seated (invert to check).

Accelerating Pump—Lower Hole (med.) Normal.

Fuel Pump Pressure: 4½ lbs. maximum.

MANIFOLD HEAT CONTROL: Automatic thermostatic type. See that valve operates freely.

VALVES: See Valve Timing.

Tappet Clearance—.010" Intake, .014" Exhaust, Cold.

STARTING: See Battery, Starter, Generator, and Regulator.

IGNITION

COIL: Auto-Lite Model IG-4093. Mounted on left side of cylinder head opposite distributor.

Ignition Current—3 amperes idling, 5 stopped.

CONDENSER: Capacity—.20-.25 microfarad.

DISTRIBUTOR: Auto-Lite Model IGS-4211. Full automatic advance type with auxiliary vacuum spark control and octane selector adjustment.

See Tune-Up for distributor specifications.

IGNITION TIMING: See Tune-Up for settings.

CARBURETION

CARBURETOR: Carter WA-1 Model 622-S (super-sedes 610-S). 1¼" Single barrel downdraft type.

See Tune-Up for carburetor adjustment directions.

Std. Metering Rod—No. 75-593. Checking Gauge No.

T109-102 (2.468"). Metering Jet No. 120-95S (.099").

FAST IDLE: Setting—With stopscrew against (not on) first step of fast idle cam, choke valve opening should be ⅝". Adjust by bending connecting link

AUTOMATIC CHOKE: Setting—Centered (at index).
AIR CLEANER: AC. Oil-bath type. Clean and refill with SAE No. 50 engine oil (SAE No. 20 below 32°F) to indicated level at 2000 mile intervals.

NOTE: Clean and re-oil filter element in oil filler cap on left side of engine at 2000 mile intervals.

FUEL PUMP: AC. No. 1539057. Diaphragm type.

Pressure—4½ lbs. maximum.

ELECTRICAL

BATTERY: Auto-Lite Type DF-1-15R. 6 volt, 15 plate, 105 Ampere Hour capacity (20 hour rate).

Grounded Terminal: Positive (+) terminal.

Location: In engine compartment on left side.

STARTER: Auto-Lite MAW-4043.

Drive: Barrel type Bendix No. A-1792.

Brush Spring Tension: 42-53 ozs. (new brushes).

Rotation: Counter-clockwise at commutator end.

Performance Data				
Torque	R.P.M.	Volts	Amperes	
0 ft. lbs.	4900	5.5	65	
18.0 "	Lock	4.0	670	

GENERATOR: Auto-Lite Model GDZ-4818-A.

Two brush (shunt) type with current-voltage control (no adjustment at generator).

Maximum Charging Rate: 35 amperes (cold), 8.0 volts, 1900 RPM, or approximately 20 MPH.

Cold Performance Data				
Amperes	Volts	R.P.M.	Amperes	Volts
0	6.4	925	0	6.4
8	6.75	1140	8	6.75
16	7.15	1370	16	7.15
24	7.5	1590	24	7.5
35	8.0	1900	35	8.0

Rotation: Counter-clockwise at commutator end.

Field Current: 1.60-1.78 amperes at 6.0 volts.

Brush Spring Tension: 35-53 ozs. (new brushes).

Belt Adjustment: ⅝" belt deflection midway between generator and fan pulley.

REGULATOR: Auto-Lite Model VRP-4004F-2.

Relay Closes: 6.4-7.0 volts (set to 6.4-6.6 volts).

Relay Opens: 4.1-4.8 volts with 4-6 amps. discharge.

Voltage Setting: 7.2-7.5 volts at 70°F.

Current Setting: 34-36 amperes (marked "35").

Checking & Adjusting: See article in *Electrical Equipment Section* for data on this unit.

LIGHTING: Headlamps—Sealed Beam type.

Adjustment: Aim upper beam straight ahead (hot spot center 3" below lamp center height at 25 feet).

Lamp Bulbs: See Specification Table on Page 31.

LIGHTING CIRCUIT BREAKER: Vibrating thermostatic type. Mounted on back of lighting switch.

FUSES: Clock—2 ampere. In clock lead wire.

Overdrive: 20 amp. On relay on engine side of dash.

ENGINE

ENGINE SPECIFICATIONS: Continental. 6 Cylinder,

Bore—3 5/16". Stroke—4¾".

Displacement—226.2 cu. ins. Rated H.P.—26.3

Developed Horsepower—100 at 3600 RPM.

Compression Ratio—7.3-1. Std. Head.

PISTONS: Four ring, aluminum alloy, cam ground, tin plated type. Weight 15.7 ozs. Length 3 9/16".

Removal: Pistons and rods removed from above.

Clearance: Fit pistons to 5-10 lbs. pull on .0015" feeler gauge.

Replacement Pistons: .002", .005", .010", .020", .030" Oversize.

Installing Pistons: Slot away from valves (Nelson Pistons), Arrow on head pointing toward front of engine (Thompson Pistons).

PISTON RINGS:	Width	End Gap
Compr. (#1, 2)	.0925-.0935"	.008-.018"
Oil (#3, 4)	.1545-.1550"	.008-.018"

Replacement Rings: .010", .020", .030" Oversize.

PISTON PIN: Floating type (locking ring each end).
Clearance: .0003" in rod bushing, .0003" in piston.
Replacement Pins: .003", .005" Oversize.

CONNECTING ROD BEARINGS: Removable, steel-backed, babbitt-lined type.

Clearance: .0007-.0025". **Sideplay:** .006-.010"

Replacement Bearings: .001", .002", .010", .012" Undersize.

Installing Rods: Oil spray hole on lower end of rod toward camshaft.

CRANKSHAFT BEARINGS: Removable, steel-backed, babbitt-lined type. No shims.

Clearance: .002-.0022". **Endplay:** .004-.006" (front).

Replacement Bearings: .002", .010", .020" Undersize.

CAMSHAFT SETTING: Mesh chain with 9 links between marked teeth on camshaft and crankshaft sprockets.

VALVES:	Head Diam.	Seat Angle	Stem Clearance
Intake	1 33/64"	30°	.0008-.0026"
Exhaust	1 21/64"	45°	.0027-.0045"

Valve Spring Pressure: 51 lbs. at 1.67" (valve closed), 113 lbs. at 1.306" (valve open).

VALVE TIMING

Valve Timing Check: With .010" tappet clearance, #1 intake valve opens with piston 10° or .043" before top dead center with tenth graduation on flywheel before "DC" mark at indicator in inspection hole in right front face of clutch housing.

LUBRICATION & COOLING

LUBRICATION: Crankcase Capacity—5½ qts. (dry), 5 qts. (refill).

Normal Oil Pressure: 35 lbs. at 30 MPH.

Oil Filter: On left side of engine block. Replace filter cartridge every 10,000 miles (or oftener).

COOLING: Capacity—15 qts.

Pressure Valve: AC. In filler cap. Opens at 4 lbs.

Thermostat: In cylinder head outlet. Choke type (no by-pass). Opens at 148-155°F.

MECHANICAL

CLUTCH: Borg & Beck Model 9A6. Single plate, dry disc type.

Pedal Adjustment: Pedal free travel ¾-1". Adjusting turnbuckle provided in clutch linkage.

Facings: I.D. 6". O.D. 9¼". Thickness ⅛".

OVERDRIVE (Frazer Only): Warner type with "kick-down" control.

Throttle Kick-down Switch Adjustment: Adjusted by loosening bracket and changing switch position.

FRONT SUSPENSION: Independent, parallelogram type with coil springs. See Specification Table Page 38.

BRAKES: Bendix (Lockheed) Hydraulic type with floating self-centering shoes (no anchor pin adjustment). Hand lever applies rear service brakes.

Clearance: .008" at heel and toe of each shoe.

Drum Diameter: 11".

Lining: Width 2". Thick. ¼". Length per wheel 22".

HOOD LOCK: Hood is Reverse Alligator type hinged at radiator. To raise hood, press in on lock handle to left of steering column, raise rear end of hood.

MODEL IDENTIFICATION

	Model	Wheelbase	Serial No.
Super Six	51	121"	31-101
Commodore Six	52	121"	32-101
Business Cars	58	128"	38-101

SERIAL & ENGINE NUMBER: See model notation above for First No. and prefix (first two figures indicate model thus: 31-101). Stamped on plate on right front door hinge pillar post and on top of engine block between #1 and #2 exhaust flanges.

TUNE-UP

COMPRESSION: Pressure—120 lbs. at cranking speed of 125 RPM.

VACUUM READING: Steady 18-21" idling 7½-8 MPH.

FIRING ORDER: 1-5-3-6-2-4.

SPARK PLUGS: Champion Special J-9 Hudson. 14 mm. Gaps—.032"

IGNITION: See Coil, Condenser, and Distributor.

Breaker Gap .020". Cam Angle 35° (closed).

Breaker Arm Spring Tension—17-20 ozs.

Rotation—Counter-clockwise viewed from above.

Automatic Advance—Starts at 400 RPM. Maximum 11.75° at 1570 RPM. (Distr. degrees & RPM).

Vacuum Advance—Starts with 6¾" vacuum. Maximum 7½° (distr.) with 10" of vacuum.

IGNITION TIMING: Std. Setting—½" BTDC.

Timing Mark—Flywheel marked "UDC.1-6/" with four graduations ¼" apart ahead of this mark. Set timing with the 3rd white line aligned with pointer in inspection hole in motor support above starter, then adjust Fuel Compensator as follows:

Fuel Compensator Setting—Advance spark (loosen vacuum unit link screw on distributor quadrant) until slight ping noted accelerating with wide open throttle between 10-15 MPH. Final setting must not be more than 1" before "UDC.1-6/".

CARBURETION: See Carburetion.

Idle Setting—Set both idle adjusting screws for smooth running and highest steady vacuum gauge reading (each screw ½-1½ turns open—turn screws in for leaner mixture). Idle speed 7½-8 MPH.

Float Level—⅛" from top of float to gasket seat on cover with valve seated (invert to check).

Accelerating Pump—Outer hole (max.) Normal.

Fuel Pump Pressure: 3-4 lbs. (AC. mechanical type), 2½-3 lbs. (Autopulse electrical type).

MANIFOLD HEAT CONTROL: Automatic thermostatic type (no adj.). Valve must operate freely.

VALVES: See Valve Timing.

Tappet Clearance—.010" Intake, .012" Exhaust, engine idling at normal operating temperatures.

NOTE—This clearance required by new No. 162962 camshaft (also supplied for service on all 6 cyl. cars). Camshaft may be identified by letter "X" stamped on front face of cam gear attaching flange and by shoulder ¼" wide on shaft between 2nd & 3rd cams from front (visible from below, pan off).

STARTING: See Battery, Starter, Generator and Regulator.

IGNITION

COIL: Auto-Lite Model IG-4098. Service Coil IG-4098S. Mounted on dash. NOTE—Coil connections are reversed (breaker connection at base of coil). Ignition Current—2½ amperes idling, 5 stopped.

CONDENSER: Auto-Lite Part No. IGW-3075C. Capacity—.20-.25 microfarad.

DISTRIBUTOR: Auto-Lite Model IGW-4203-A with separate VC-3060ES Vacuum unit. Full automatic advance type with auxiliary vacuum spark control and Fuel Compensator adjustment.

See Tune-Up for distributor specifications.

IGNITION TIMING: See Tune-Up for settings.

CARBURETION

CARBURETOR: Carter WDO Model 501-S. 1" Dual, double barrel downdraft type with Climatic Contr. See Tune-Up for carburetor adjustment directions.

Std. Metering Rod—No. 75-467. Checking Gauge No. T109-113 (2.280"). Metering Jet No. 120-65S (.082").

FAST IDLE: Setting—With choke valve closed and fast idle screw on high lobe of fast idle cam, turn screw in until throttle opening is .045".

AUTOMATIC CHOKE: Setting—1 Point Lean.

AIR CLEANER: AC Oil-wetted type Std., United Oil-bath type Optl.

Servicing—Clean and re-oil filter elements (oil-wetted type), clean and renew oil in sump (oil-bath type) at 2000 mile intervals or oftener if required. NOTE—Oil-bath cleaner capacity 1 Pint engine oil. Use same grade oil as used in engine crankcase.

FUEL PUMP: AC Type AK (Exch. No. 499) Diaphragm type or Autopulse Electrical type. Pressure—3-4 lbs. (AC), 2½-3 lbs. (Autopulse).

ELECTRICAL

BATTERY: National. 6 volt, 17 plate, 96 A. H. Grounded Terminal—Positive (+) terminal. Location—In engine compartment on left side.

STARTER: Auto-Lite MZ-4092. Armature MZ-2138.

Drive—Inboard Barrel type Bendix No. A-1684.

Rotation—Counter-clockwise at commutator end.

Brush Spring Tension—42-53 ozs. (new brushes).

Cranking Engine—150 RPM. 125 amperes, 5.4 volts.

Performance Data

Torque	RPM	Volts	Amperes
0 ft. lbs.	4300	5.5	70
7.65 "	220	4.0	400
11.8 "	Lock	4.0	560

GENERATOR: Auto-Lite Model GEC-4801A. Armature GDZ-2006F. Third brush control type with voltage regulation. Ventilated by fan on drive pulley.

Maximum Charging Rate—44 amperes (cold), 8.0 volts, 3400 RPM or approx. 35 MPH.

Charging Rate Adjustment—See Regulator. Third brush should be set 1 commutator bar min., 1 bar plus 1 mica strip max. from nearest main brush.

Cold				Hot			
Amperes	Volts	RPM		Amperes	Volts	RPM	
0	6.4	960		0	6.4	1040	
8	6.7	1160		8	6.7	1280	
16	7.0	1400		16	7.0	1600	
24	7.25	1700		24	7.25	2090	
32	7.65	2100		32	7.65	3000	
41	8.0	3350		34	8.0	3800	

Rotation—Counter-clockwise at commutator end.

Brush Spring Tension—53 ozs. max. (new brushes).

Field Current—1.60-1.78 amperes at 6.0 volts.

Belt Adjustment—¾" deflection midway between generator and fan pulleys.

REGULATOR: Auto-Lite VRR-4001A. Voltage Type.

Cutout Relay Closes—6.4-6.6 volts. Opens 4.2-4.8 volts with approx. 4-6 ampere discharge current.

Voltage Regulator Setting—7.1-7.4 volts at 70°.

Checking & Adjusting—See article in Electrical Equipment Section on this unit.

LIGHTING: Headlamps—Hall Sealed Beam type.

Adjustment—Aim upper beam straight ahead (hot spot center 3" below lamp center height at 25').

Lamp Bulbs—See Specification Table on Page 31.

FUSES: Lighting—30 ampere. Two silver-plated type on fuse block on back of instrument panel.

Clock—2 ampere. In case on back of clock.

Direction Indicator—10 ampere. In flasher lead.

Heater—14 ampere. On left side of heater.

Radio—20 ampere.

ENGINE

ENGINE SPECIFICATIONS: Six Cylinder, "L" head. Bore—3" Stroke—5"

Displacement—212 cu.ins. Rated H.P.—21.6

Developed Horsepower—102 at 4000 RPM.

Compression Ratio—6.5-1 Std. Cast Iron Head.

PISTONS: Aluminum alloy, cam ground type.

Weight—10.5 ozs. Length—3 3/16".

Removal—Pistons and rods removed from above.

Clearance—.0005-.001". Use .0015" feeler stock ½" wide. Pull to withdraw feeler should be 3-4 lbs.

Installing Pistons—Slot away from camshaft.

PISTON RINGS: Width End Gap Side Clearance

Compr. (#1, 2) 3/32" .009-.011" .001"

Oil (#3) 3/16" .009-.011" .001"

Oil (#4) 5/32" .009-.011" .001"

NOTE—Rings are pinned type. Clearance at pin must be kept uniform with end gap.

PISTON PIN: Floating type (locking ring each end).

Clearance—.0003" in rod bushing and piston (piston heated to 200°F).

CONNECTING ROD BEARINGS: Spun alloy lined type. No shims. Install exchange rods.

Clearance—.001". Sideplay—.007-.013".

Installing Rods—Widest half or offset of lower bearing toward rear of engine (#1, 2, 4—Six Cyl.; #1, 3, 5, 7—8 Cyl.), toward front (#3, 5, 6—Six Cyl.; #2, 4, 6, 8—8 Cyl.). Oil scoop on bearing cap toward camshaft on all rods.

CRANKSHAFT BEARINGS: Removable, bronze-backed, babbitt-lined type. No shims.

Clearance—.001" Endplay .006-.012" (center).

CAMSHAFT SETTING: Mesh marked tooth on crankshaft gear with marked teeth of camshaft gear.

NOTE—Aluminum camshaft gear used on later cars (must be used as set with special crankshaft gear).

VALVES: Head Diam. Seat Angle Stem Clearance

Intake (Six) 1⅝" 45° .0025"

Intake (Eight) 1½" 45° .0025"

Exhaust (All) 1⅝" 45° .004"

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Valve Spring Pressure—40 lbs. at 2" (closed), 80 lbs. at 1 21/32" (valve open). Free length 2 17/64".

VALVE TIMING

Valve Timing Check—With .010" tappet clearance, #1 intake valve opens 10°40' BTDC with point on flywheel 4 teeth ahead of top dead center mark "UDC.1-6/" at indicator in inspection hole above starter. NOTE .010" is regular tappet clearance.

LUBRICATION & COOLING

LUBRICATION: Crankcase Capacity—5½ qts. (dry), 4½ (refill). NOTE—If pan removed, place 1½ qts. in upper tray before pan replaced, additional 4 qts. in oil filler after pan in place.

Normal Oil Pressure—4-12 lbs. (no gauge).

Oil Filter—Hudson type. Optl. Replace cartridge at 5000-6000 mile intervals.

COOLING: Capacity—13 qts.

Thermostat—In cylinder head outlet. Starts to open at 150-155°F. Fully open at 185°F.

MECHANICAL

CLUTCH: Own. Single plate type with cork-insert type driven member. Operates in oil.

Pedal Adjustment—Clearance between toeboard and rear face of pedal must be 1½". Adjust by turning clevis on pedal to throw-out lever.

Facings—Driven Member consists of steel disc with cork inserts. Two types used as follows:

	I.D.	O.D.	No. Corks
51 & 52①	5¼"	9"	90
51 & 52②, 53, 54, 58	6⅞"	10"	108

①—No Overdrive, Vacuum Drive, DriveMaster.
②—With equipment listed above.

Servicing—Drain and refill clutch housing with ½ pint Hudsonite at 5000 mile intervals.

VACUUM DRIVE: Optl. Equipment automatic clutch control (with vacuum-power cylinder).

Adjustment—See 1942 Hudson Vacuum Drive article for complete adjustment instructions.

DRIVE-MASTER: Optl. Equipment. Special automatic shift transmission used in conjunction with Vacuum Drive (automatic clutch control).

Adjustment—See 1942 Hudson Drive-Master Transmission Control article for complete instructions.

OVERDRIVE: Warner Type R9B (used with Hudson Transmission). "Kick-down" type with electrical engagement and disengagement.

FRONT SUSPENSION: Independent, parallelogram type with coil springs. See Specification Table Page 38.

BRAKES: Bendix Hydraulic, Single Anchor "No Eccentric" type with Hudson Mechanical Follow-up. Hand lever applies rear wheel service brakes.

Clearance—.0075" (.015" at each end of secondary shoe with primary shoe out against drum). NOTE—can be adjusted by backing off adjusting screw in each wheel 14 notches from Heavy Drag position. **Mechanical Follow-up Adjustment**—1¼" clearance between pushrod tube face and pedal rod.

Drum Diameter—10" (51, 52), 11" (53, 54, 58).

Lining—Molded (primary shoes), Woven (secondary shoes). Width 1¼". Thickness 7/32". Length per wheel 19 27/32" (51, 52), 21 19/32" (53, 54, 58).

HUDSON 8

HOOD LOCK: Same as Hudson Six Cylinder models.

MODEL IDENTIFICATION

	Model	Wheelbase	Serial No.
Super Eight	53	121"	33-101
Commodore Eight	54	121"	34-101

SERIAL & ENGINE NUMBER: See model notation above for first No. and prefix (first two figures indicate model thus: 33-101). Stamped on plate on right front door hinge pillar post and on top of engine block between #1 and #2 exhaust flanges.

TUNE-UP

COMPRESSION: Pressure—120 lbs. at cranking speed of 125 RPM.

VACUUM READING: Steady 18-21" idling 7½-8 MPH.

FIRING ORDER: 1-6-2-5-8-3-7-4.

SPARK PLUGS: Champion Special J-9 Hudson. 14 mm.. Gaps—.032"

IGNITION: See Coil, Condenser, and Distributor.

Breaker Gap—.017" Cam Angle 31° (closed).

Breaker Arm Spring Tension—17-20 ozs.

Rotation—Clockwise viewed from above.

Automatic Advance—Starts at 300 RPM., 3° at 400 RPM., Maximum 17.5° at 1700 RPM (Distr. ° & RPM)

IGNITION TIMING: Std. Setting—At TDC.

Timing Mark—Flywheel marked "UDC.1-8" with four graduations ¼" apart ahead of this mark. Set timing with first white line aligned with pointer in inspection hole in motor support above starter, then adjust Fuel Compensator as follows:

Fuel Compensator Setting—Advance spark (loosen hold-down screw and rotate distributor) until slight ping noted when accelerating with wide open throttle between 10-15 MPH. Final setting must not be more than ¾" before "UDC.1-8/".

CARBURETION: See Carburetion.

Idle Setting—Set both idle adjusting screws for smooth running and highest steady vacuum gauge reading (each screw ½-1½ turns open—turn screws in for leaner mixture). Idle speed 7½-8 MPH.

Float Level—⅝" from top of float to gasket seat on cover with valve seated (invert to check).

Accelerating Pump—Outer hole (max.) Normal.

Fuel Pump Pressure: 3-4 lbs. (AC. mechanical type), 2½-3 lbs. (Autopulse electrical type).

MANIFOLD HEAT CONTROL: Automatic thermostatic type (no adj.). Valve must operate freely.

VALVES: See Valve Timing.

Tappet Clearance—.006" Intake, .008" Exhaust, engine idling at normal operating temperatures.

STARTING: See Battery, Starter, Generator and Regulator.

IGNITION

COIL: Auto-Lite Model CE-4029. Service Coil CE-3224JS. Mounted on the dash.

CONDENSER: Auto-Lite Part No. IG-2671.

Capacity—20-25 microfarad.

DISTRIBUTOR: Auto-Lite Model IGP-4008-A or IGP-4008-B. Full automatic advance type (no vacuum control) with Fuel Compensator adjustment. See Tune-Up for distributor specifications.

IGNITION TIMING: See Tune-Up for settings.

CARBURETION

CARBURETOR: Carter WDO Model 502-S. 1¼" Dual, double barrel downdraft type with Climatic Contr.

See Tune-Up for carburetor adjustment directions.

Std. Metering Rod - No. 75-529. Checking Gauge No. T109-113 (2.280"). **Metering Jet** No. 120-121S (.086").

FAST IDLE: Setting—With choke valve closed and fast idle screw on high lobe of fast idle cam, turn screw in until throttle opening is .053".

AUTOMATIC CHOKE: Setting—1 Point Lean.

AIR CLEANER: AC Oil-wetted type Std., United Oil-bath type Optl.

Servicing—Clean and re-oil filter elements (oil-wetted type), clean and renew oil in sump (oil-bath type) at 2000 mile intervals or oftener if required.

FUEL PUMP: AC Type AK (Exch. No. 499) Diaphragm type or Autopulse Electrical type. Pressure—3-4 lbs. (AC), 2½-3 lbs. (Autopulse).

ELECTRICAL

All Electrical Equipment and specifications same as used on Hudson Six (see preceding article) except as noted

BATTERY: National. 6 volt, 19 plate, 108 A. H. Grounded Terminal—Positive (+) terminal.

Location - In engine compartment on left side.

STARTER: Auto-Lite MAB-4100. Armature MAB-2113.

Drive—Inboard Barrel type Bendix No. A-1684.

Rotation—Counter-clockwise at commutator end.

Brush Spring Tension—42-53 ozs. (new brushes).

Cranking Engine—150 RPM, 125 amperes, 5 volts.

Performance Data

Torque	R.P.M.	Volts	Amperes
0 ft. lbs.....	3700.....	5.5.....	60.....
10.15 ".....	420.....	4.0.....	400.....
21.5 ".....	Lock.....	4.0.....	750.....

For Generator, Regulator, Lighting, & Fuse data, see Hudson Six article (preceding).

ENGINE

ENGINE SPECIFICATIONS: 8 Cylinder, "L" head type.

Bore—3". **Stroke**—4½".

Displacement—254 cu. ins. **Rated H.P.**—28.8

Developed Horsepower—128 at 4200 RPM.

Compression Ratio—6.5-1 Std. Cast Iron Head.

All Engine data (Pistons, Rings, Pins, Bearings, etc.) same as for Hudson Six except as noted. See Hudson Six article (preceding).

VALVE TIMING

Valve Timing Check—With .010" tappet clearance, #1 intake valve opens 10°40' BTDC with point on flywheel approx. 3.97 teeth ahead of top dead center mark "UDC.1-8/" at indicator in inspection hole above starter.

Tappet Clearance:—.006" Int., .008" Exh. Hot.

LUBRICATION & COOLING

LUBRICATION: Crankcase Capacity—9 qts. (dry), 7 qts. (refill). NOTE—If pan removed, place 2 qts. in upper tray before pan replaced, additional 7 qts. in oil filler after pan in place.

Normal Oil Pressure—4-12 lbs. (no gauge).

Oil Filter—Hudson type Optl. Replace cartridge at 5000-6000 mile intervals.

COOLING: Capacity—18 qts.

Thermostat—In cylinder head outlet (by-pass type on Model 54 only). Begins to open at 150-155°F. Fully open at 185°F.

MECHANICAL

All Mechanical data (Clutch, Suspension, Brakes, etc.) same as for Hudson Six except as noted. See Hudson Six article (preceding).

MODEL IDENTIFICATION

NOTE: Army designation for this model is "¼ Ton 4x4 Truck." Built by Ford and Willys to same design under the following model designations which are stamped on name plate on right hand side of instrument panel:

Ford.....GPW. Willys.....MB.

SERIAL NUMBER: Stamped on Name Plate on right hand side of instrument panel.

ENGINE NUMBER: Stamped on boss on right front upper corner of engine block near water pump.

TUNE-UP

COMPRESSION: Pressure—110 lbs. at cranking speed of 185 RPM for Std. 6.48-1 Cast Iron Head.

VACUUM READING: Steady 21-23" idling at 8 MPH.

FIRING ORDER: 1-3-4-2. See diagram.

SPARK PLUGS: Auto-Lite Type AN-7. 14 mm. Metric. Gaps—.030".

IGNITION: See Coil, Condenser, and Distributor. Breaker Gap—.020". Cam Angle 47° closed (IGC-4705), 41° closed (IAD-4008).

Breaker Arm Spring Tension—17-20 ozs.

Rotation—Counter-clockwise viewed from above.

Automatic Advance—Starts at 250 RPM. Maximum advance 11° at 1500 RPM (Distr. degrees & RPM).

IGNITION TIMING: See Ignition Timing.

Std. Setting—5° BTDC (72 Octane Fuel), At TDC (68 Octane Fuel) with flywheel mark "IGN" (5° BTDC setting), "TC" (TDC setting) at center of inspection hole in right front face of housing.

CARBURETION: See Carburetor & Carb. Equipment. Idle Setting—Idle screw 1-2 turns open (turn screw out for richer mixture). Idle speed 8 MPH.

Float Level— $\frac{3}{8}$ " from top of float at free end to machined surface (gasket seat) on bowl cover. Invert assembly to check. Do not compress spring in valve stem.

Accelerating Pump—No seasonal adjustment.

Fuel Pump Pressure: $4\frac{1}{2}$ lbs. maximum.

MANIFOLD HEAT CONTROL: Automatic thermostatic type. No adjustment required. When installing assembly, see that thermostatic spring end rests on top of spring stop bracket on manifold.

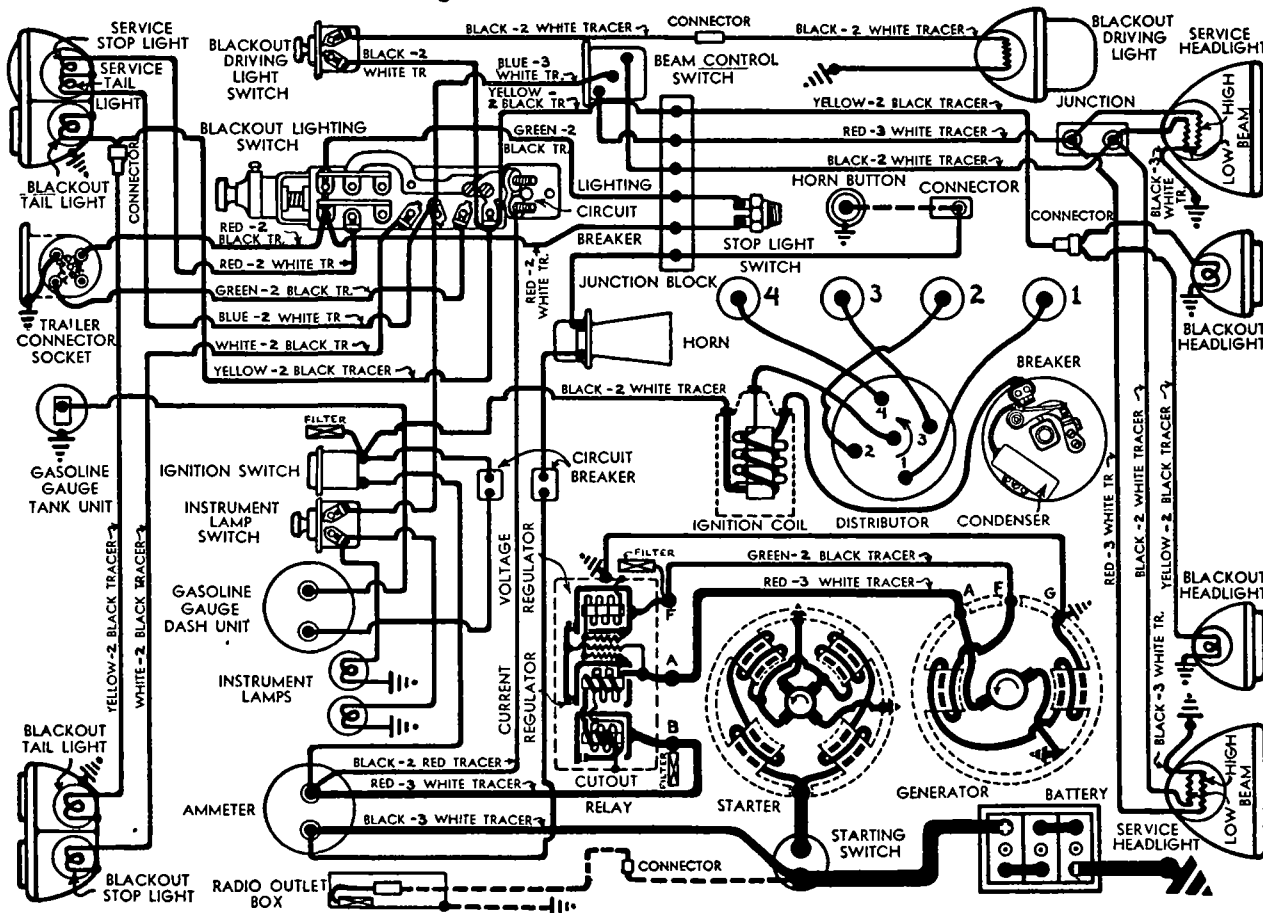
CAUTION: Check valve for free operation when tuning up engine.

CRANKCASE VENTILATOR: Remove and clean Vacuum Control Valve on manifold. See Crankcase Ventilator (following Carburetion) for directions.

VALVES: See Valve Timing.

Tappet Clearance—.014" All Valves, Hot or Cold.

NOTE: Adjusting screws are self-locking type (no locknuts).



STARTING: See Battery, Starter, Generator, Regulator.

IGNITION

COIL: Auto-Lite Model IG-4070L. Service Coil Auto-Lite IG-4070NS. Mounted on right side of engine block near distributor.

Ignition Current—2.5 amperes idling, 5 stopped.

CONDENSER: Auto-Lite Part No. IGW-3139. Capacity—.18-.26 microfarad.

DISTRIBUTOR: Auto-Lite Model IGC-4705 or IAD-4008. Single breaker, 4 lobe cam, full automatic advance type.

See Tune-Up for distributor specifications.

CARBURETION

Carburetor: Carter WO Type 539-S. 1" Single Barrel Downdraft type with manual choke control (Interconnected with throttle to provide fast idle). See Tune-Up for carburetor adjustment directions.

Std. Metering Rod—No. 75-547. Checking Gauge No. T109-26 (2.718". Metering Rod Jet 120-151S (.070").

Fast Idle: Choke valve interconnected with throttle valve to open throttle to fast idle position when choke in use. No adjustment required.

Air Cleaner: Oakes Model No. 613300. Oil-bath type. Capacity—1¼ pints SAE No. 20 or 30 (Summer), 10 (Winter) engine oil. Change oil at 2000 mile intervals; more often if required by operating conditions.

Fuel Pump: AC Type No. 1523096 or 1538312. Diaphragm type fuel pump. NOTE—Pump has hand lever on side of pump body for hand operation (priming).

Pressure—1½-2½ lbs. (4½ lbs. max. at 1800 RPM).

Fuel Strainer: Type T2, AC No. 1595848. Disc type mounted on right side of dash.

Servicing: Remove plug and drain bowl, remove bowl and filter element, clean element in solvent, wash out bowl, re-install (weekly).

CRANKCASE VENTILATOR

Sealed Positive Ventilation Type. Consists of Air Intake Pipe from Air Cleaner to Crankcase Oil Filler (Oil Filler Cap has gasket and must seat tightly to prevent air leaks at this point) and Air Outlet Pipe from Valve Chamber Cover to Intake Manifold. There is a Vacuum Valve at the manifold connection and this valve must close at idling speed for satisfactory engine idling performance.

Servicing: Make certain that connecting pipes are tight and that oil filler cap gasket seals cap tightly. Remove and clean control valve when tuning engine or whenever system does not operate satisfactorily.

Vacuum Control Valve: Remove control valve by disconnecting pipe at valve chamber cover and unscrewing valve from manifold, clamp valve in vise and remove top of housing, withdraw valve and spring. Clean valve and valve seat thoroughly. Reassemble and re-install unit.

ELECTRICAL

BATTERY: Auto-Lite TS-2-15 or Willard SW-2-119 (Orig. Equip.), Auto-Lite TG-2-15 or Willard MW-2-125 (Replacement). 6 volt, 15 plate, 118 Ampere Hour Capacity (Auto-Lite), 6 volt, 17 plate, 125 Ampere Hour Capacity (Willard) at 20 hour rate.

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Grounded Terminal—Negative (—) terminal to frame.

Engine Ground—Strap connector at left front engine mounting bracket and additional ground strap between cylinder head (at rear) and dash.

Location—In engine compartment on right side.

STARTER: Auto-Lite MZ-4113. Armature MZ-2089.

Drive—Special Barrel Type Bendix No. A-2233.

Rotation—Counter-clockwise at commutator end.

Brush Spring Tension—42-53 ozs. (new brushes).

Cranking Engine—185 RPM, 150-175 amps., 5 volts.

Performance Data

Torque	RPM	Volts	Amperes
0 ft. lbs.	4300	5.5	70
.65 "	2500	5.5	100
2.55 "	1325	5.0	200
4.95 "	750	4.5	300
7.65 "	220	4.0	400
7.8 "	Lock	3.0	420
11.7 "	Lock	4.0	560

GENERATOR: Auto-Lite GEG-5001-A, GEG-5002-D, GEG-5101D.. Two brush shunt type, external vibrating type voltage and current regulation. Ventilated by fan. CAUTION—Internal wiring of this generator (and regulator) is not similar to other Auto-Lite units and these generators and regulators must always be used together.

Maximum Charging Rate—40 amperes, 8.0 volts, 1465 RPM. Actual charging rate controlled by regulator and dependent on battery condition.

Charging Rate Adjustment—None. See Regulator.

Performance Data

Amperes	Volts	RPM
8	7.0	930
8	7.6	955
40	7.6	1460
40	8.0	1465

Rotation—Counter-clockwise at commutator end.

Brush Spring Tension—64-68 ozs. (new brushes).

Field Current—1.60-1.78 amperes at 6.0 volts.

Motoring Current—4.7-5.2 amperes at 6.0 volts.

Belt Adjustment: Make certain generator brace is locked (pull generator out until brace locks), loosen brace nut, move generator out until belt deflection midway between generator and fan pulleys is 1", tighten brace nut.

NOTE—Generator brace is designed to stop fan and generator rotation when desired. Lifting up on brace handle slackens off drive belt.

REGULATOR: Auto-Lite VRY-4203-A Voltage-Current Type. Regulator case mounted on right side in engine compartment. Consists of Cutout Relay and vibrating type Voltage and Current Regulators.

CAUTION—Internal wiring of this regulator (and generator) is not similar to other Auto-Lite units and these regulators and generators must always be used together.

Cutout Relay

Cuts In—6.4-6.6 volts.

Cuts Out—5-6.0 ampere discharge current.

Contact Gap—.015" minimum.

Air Gap—.0595-.0625" with contacts open.

Voltage Regulator

Setting—7.35 volts at 70° F.

To Check—Connect ammeter in charging line at regulator "B" terminal (use short heavy leads), connect voltmeter between "B" terminal and ground. Operate generator at speed equivalent to 30 MPH charging a fully charged battery until voltage is steady (charging rate approx. 10 amperes), note voltmeter reading which should agree with setting above.

To Adjust (with cover removed)—Change regulator armature spring tension by bending lower spring hanger slightly. Increase tension to increase operating voltage, decrease tension to decrease voltage.

Contact Gap—.010-.012". **Spring Tension** 7-8 ozs.

Air Gap—.040-.042" with contacts just opening.

Current Regulator

Setting—39-41 amperes (marked "40" on cover).

To Check—Connect test meters as for voltage check (above). Operate generator at speed equivalent to 30 MPH charging battery, turn on car lights and accessories or connect load (bank of headlamp bulbs, etc.) between ammeter and battery so that generator charges at peak rate and current regulator operates. Note ammeter reading which should agree with Setting above.

To Adjust (with cover removed)—Same as for Voltage Regulator (above).

Contact Gap—.030-.033". **Spring Tension** 7-8 ozs.

Air Gap—.047-.049" with contacts just opening.

LIGHTING: Lighting System—Two lighting systems provided, both controlled by the main lighting switch (Blackout Lighting Switch) as follows:

Blackout (1st Switch "On" Position)—Blackout Headlights, Blackout Tail Lights (right & left) and Blackout Stop Light (right side) operative. Blackout Driving Light (on left fender) operative with Blackout Driving Light Switch "on".

Service (2nd Switch "On" Position)—Service Headlights, Service Tail Light (left side) and Stop Light (left side) operative. Panel Lights operative with Panel Light Switch "on". Headlight upper and lower beams are controlled by Beam Selector Switch on toeboard.

Day Driving (3rd Switch "On" Position)—Switch knob must be placed in this position to make the Service Stop Light operative for daytime driving (stop light lead taken through switch—see diagram). NOTE—Switch knob has lock button which must be pressed down to enable switch to be placed in any other position than "Off" and "Blackout."

Service Headlamps—Sealed Beam type. Headlamps are adjusted so that center of Upper Beam "hot spot" is aimed straight ahead and 7" below lamp center height at 25 feet.

Blackout Driving Light—Special shielded Sealed Beam type. This light adjusted so that center of beam "hot spot" is aimed straight ahead and 2.1" below lamp center height at 10 feet.

Switches

Blackout Lighting (Main) Switch—To remove switch, loosen setscrew in knob, unscrew knob, loosen hex. head screw at side of switch bushing on front of panel, press Blackout control button in and pull bushing off, remove mounting nut, take switch

out from under panel, mark all wires before disconnecting them.

Blackout Driving Light Switch—Clum. To remove, loosen setscrew in knob, unscrew knob, remove mounting nut on front of panel, remove switch from under panel, disconnect wires.

Panel Light Switch—Clum. Removed in same manner as Blackout Driving Light Switch.

Bulb Specifications—See Table on Page 31.

LIGHTING CIRCUIT BREAKER: Mounted on back of lighting switch. Vibrating thermostatic type. Protects lighting circuits by limiting current to 30 amperes. No adjustment.

GASOLINE GAUGE & HORN CIRCUIT BREAKERS: Mounted on back of instrument panel. Vibrating thermostatic types. Protect circuits by limiting current. No adjustment.

ENGINE

ENGINE SPECIFICATIONS: Own Make. Four cylinder, "L" Head type. Cylinder block and crankcase cast enbloc. Cylinders offset from center-line of crankshaft toward camshaft side of engine.

Bore—3 1/8" (3.125-3.127"). **Stroke**—4 3/8".

Displacement—134.2 cubic inches.

Rated Horsepower (SAE)—15.63

Developed Horsepower—54 at 4000 RPM.

Compression Ratio—6.48-1 Std. Cast Iron Head.

ENGINE REMOVAL: To remove engine from chassis as required for such service items as crankshaft and camshaft overhaul, perform the following operations in sequence:

1. **Drain Cooling System.** Drain cocks located at lower left corner of radiator and right front corner of cylinder block.

2. **Remove Battery.** Disconnect battery cables, remove battery from box on right side of engine.

3. **Remove Radiator.** Disconnect and remove upper and lower hoses, radiator stay rod, and hold-down nuts, lift radiator out. Do not lose radiator mounting pads. NOTE—Not necessary to remove radiator grille.

4. **Remove Air Cleaner.** Disconnect and remove air cleaner hose connection, remove wing nuts on mounting bracket and lift cleaner out. CAUTION—Use care not to spill oil in cleaner.

5. **Remove Starter.** Disconnect cable at starter terminal. Remove two flange mounting capscrews and bolt in support bracket at commutator end, pull starter forward to clear Bendix Drive and lift out.

6. **On Right Side of Engine,** disconnect generator leads and ignition coil leads to distributor. Remove heat indicator bulb from cylinder head (CAUTION—Use care not to kink or break tube), disconnect engine ground strap (at right front engine mounting bracket), remove two bolts in engine mounting.

7. **On Left Side of Engine,** disconnect throttle and choke control rods at carburetor, and governor dash control cable at governor (if used). Disconnect and remove horn. Remove fuel tank filler cap (to relieve pressure), disconnect fuel line at fuel pump. Disconnect oil gauge lines at crankcase, remove accelerator linkage rod. Disconnect exhaust pipe at manifold. Remove two bolts in left front engine mounting.

8. **Underneath Engine,** disconnect rear end of engine stay cable at frame cross-member (left side),

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remove bell housing attaching bolts leaving one bolt at each side to support engine weight.

9. Remove Engine. Attach chain hoist to engine and take up on hoist just enough to support engine without binding remaining bell housing bolts, remove these bolts. Swing engine forward to withdraw clutch shaft from bushing in flywheel, lift engine out.

INSTALLATION CAUTION—Place small amount of grease in clutch shaft bushing in flywheel before installing engine.

PISTONS: Lynite Lo-Ex Aluminum Alloy, "T" Slot, Cam ground, tin-plated type with heat insulation groove above top piston ring.

Length—3 $\frac{3}{4}$ ".

Removal—Pistons and rods removed from above.

Clearance—.0205-.0225" top, .003" skirt.

Replacement Pistons: Finished pistons furnished .010", .020", .030" Oversize. **CAUTION**—Pistons must not be "lapped" in (will destroy tin-plating).

Fitting New Pistons: Use .003" feeler stock, $\frac{3}{4}$ " wide, inserted between piston and cylinder wall on opposite side from "T" slot. Pull required to withdraw feeler must be within 5-10 lbs. at 70°F.

Installing Pistons: "T" slot toward valve (left) side of engine (opposite side from oil spray hole in connecting rod lower end).

PISTON RINGS: Two compression, one oil control ring per piston, all above pin (piston has narrow heat insulation groove above top ring groove). Oil ring groove drilled with oil drainage holes.

Ring	Width	End Gap	Side Clearance
Compression	3/32"	.008-.013"	.0005-.001"
Oil Contr.	3/16"	.008-.013"	.001-.0015"

Replacement Rings: Furnished .010", .020", .030" Oversize. See "Installing Rings" for types used.

Installing Rings: Install compression rings with mark "TOP" (on side) toward top. Rings have taper face and must be installed correctly. Top ring inner bevel edge must be up.

PISTON PIN: Diameter .8117-.8119". Length 2 25/32". Pin is locked in connecting rod by clampscrew.

NOTE—On new pistons, pin hole is .8118-.8120" in diameter and is diamond-bored and tin-plated.

Pin Fit in Piston—.0001-.0005" clearance or light thumb push fit with piston and pin at 70°F.

Replacement Pins: Furnished Standard and .001", .002", .003" Oversize.

CONNECTING ROD: Length 9.1875".

Crankpin Journal Diameter—1 15/16".

Lower Bearing—Steel-backed, babbitt-lined, replaceable type. **CAUTION**—Oil spray hole in upper half of bearing must line up with oil spray hole in rod.

Clearance—.0005-.0025". **Sideplay**—.005-.009".

NOTE—"Palnuts" used as locknuts on connecting rod bolts. To install palnut, after regular bolt nut tightened to 50-55 ft.lbs., turn palnut up against regular nut (flat face in), then tighten palnut $\frac{1}{2}$ turn additional.

Bearing Adjustment: None (no shims). Replace bearings. Do not file connecting rods or bearing caps.

NOTE—Replace bearings when clearance exceeds .005" or sideplay exceeds .013".

Replacement Bearings: Furnished Standard & .010", .020", .030" Undersize.

Installing Rods: Lower bearing offset. Install rods with offset (wider side) away from nearest main bearing or toward front of engine (#2, #4), toward rear (#1, #3). Oil spray hole in lower end of rod away from camshaft.

CRANKSHAFT: Three bearing type with four integral counterweights.

Journal Diameters—2.3340. (all bearings).

Bearings—Steel-backed, babbitt-lined, replaceable type. Bearing shells are dowelled in bearing caps and crankcase.

Clearance—.001-.0025" (.0005-.001" new).

NOTE—Replace bearings when clearance exceeds .006" or when endplay exceeds .018".

Bearing Adjustment: None (no shims). Replace bearings. Do not file bearing caps. See *Crankshaft Servicing data below*.

Replacement Bearings: Furnished Standard & .010", .020", .030" Undersize.

NOTE—Engine must be removed from chassis for bearing replacement and crankshaft servicing. See *Engine Removal instructions (above)*.

Crankshaft Servicing: Main Bearing Replacement—Make certain that oil holes in bearings line up with oil holes in crankcase and see that bearings fit snugly on dowel pins in crankcase and bearing caps.

Rear Bearing Oil Seal—Consists of a wick type packing installed in grooves in bearing cap and crankcase. To install new packing, insert packing in groove, use round piece of wood or steel to "roll" packing into groove, working from both ends toward center. With packing firmly seated in groove, cut off ends flush with surface. **NOTE**—Crankshaft must be removed to install packing in upper (crankcase) half of bearing.

Rear Bearing Cap Seal—Bearing cap sealed by cylindrical rubber packing strips inserted in holes between cap and case. When installing bearing cap, coat upper face lightly with sealing compound, insert new packing strips after cap is in place. Packing strips should protrude $\frac{1}{4}$ " to provide proper compression when oil pan installed. **CAUTION**—Do not cut off this protruding portion of the packing.

End Thrust: Taken by flanged faces of #1 (front) bearing. Adjustable by adding or removing shims between crankshaft sprocket thrust washer and sprocket. **NOTE**—Crankshaft sprocket must be removed with a gear puller in order to make endplay adjustments.

Endplay—.004-.008".

CAMSHAFT: 4 bearing. Non-adjustable chain drive.

Journal Diameters—#1, 2.188"; #2, 2 $\frac{1}{4}$ "; #3, 2 3/16"; #4, 1 $\frac{3}{4}$ ".

Bearings—Removable steel-backed, babbitt-lined bushing (front), machined in crankcase (all others). **Clearance**—.002-.0035". Service limit .006" (front), .008" (all others).

Timing Chain: Link-Belt two-sprocket (non-adjustable) type. Width 1". Pitch $\frac{1}{2}$ ". Length 47 links or 23 $\frac{1}{2}$ ".

Camshaft Setting: With #1 piston on top dead center, mesh chain with marks on sprockets adjacent and in line with a straightedge across the shaft centers.

VALVES: Head Diameter Stem Diameter Length

Intake1 17/32".....373".....5 $\frac{3}{4}$ " (overall)
Exhaust1 15/32".....3725".....5 $\frac{3}{4}$ " (overall)

Seat Angle Lift Stem Clearance

Intake45°.....23/64"......0015-.00325"
Exhaust45°.....23/64"......002-.00375"

Valve Springs: Install springs with closed-coil end up toward cylinder block. Spring free length 2 $\frac{1}{2}$ ".

	Spring Pressure	Spring Length
Valve Closed	50 lbs.	2 7/64"
Valve Open	116 lbs.	1 3/4"

VALVE TIMING

Valve Timing Check—Set tappet clearance #1 intake valve at .020". This valve should open with #1 piston 9° or .039" before top dead center with flywheel mark "I.O." centered in inspection hole on right front face of flywheel housing below starter. Reset tappet clearance to .014" running clearance.

LUBRICATION & COOLING

Lubrication System: Pressure to crankshaft, connecting rod, and camshaft bearings and to timing chain. **Crankcase Capacity**—5 qts. (Dry—when filter drained or replaced), 4 qts. (refill).

Normal Oil Pressure—40-50 lbs. (20-25 lbs. actual) at normal speeds or 10 lbs. minimum idling.

NOTE—On first cars, oil pressure was 75 lbs. (40 lbs. actual) at 30 MPH.

Oil Pressure Relief Valve—Located under plug on oil pump cover. Opens at 25 lbs. (50 lbs. gauge pressure). Adjustable by adding or removing shims above spring within plug.

Oil Filter: Mounted on bracket on right of engine. Oil Filter Element Purolator No. 26637.

CAUTION—Filter should be drained at 1000 mile intervals and filter element replaced at 6000 mile intervals for normal service.

Cooling System: Pressure type with pressure valve (relief valve) in filler cap.

Capacity—11 quarts.

Pressure Valve—AC No. 846709 (Radiator Filler Cap). Opens at 3 $\frac{3}{4}$ lbs. (3 $\frac{3}{4}$ -4 $\frac{1}{4}$ lbs.).

Thermostat: In outlet elbow on cylinder head.

Setting—Starts to open 145-155°F. Fully open 170°F.

MECHANICAL

CLUTCH: Atwood Model TP-2B-7-1 with Borg & Beck No. 11123 Driven Member. Single plate type.

Facings—One Woven, one Molded Asbestos. Inside Diameter 5 $\frac{1}{8}$ ", Outside Diameter 7 $\frac{7}{8}$ ". Thickness $\frac{1}{8}$ " (.125").

Adjustment: Pedal free travel $\frac{3}{4}$ " (provides 1/16" clearance between release bearing and clutch release levers). To adjust, loosen locknut on clutch fork connecting cable clevis at cross-shaft connection, screw cable end out of clevis, tighten locknut.

Removal: Remove Transmission & Transfer Case Assembly (see Transmission Removal below), remove flywheel bell housing. Mark clutch pressure plate and flywheel to insure re-installation in same relative position. Take out mounting screws in clutch cover flange, turning all screws out evenly to relieve spring pressure, remove clutch assembly and driven member.

TRANSMISSION: Warner T84J. Three-speed type with conventional shift lever mounted on top of case. Constant-mesh, synchro-mesh, helical gears (Second & High), sliding spur gear (Low & Reverse).

Transfer Case: Spicer Model 18. Two-speed auxiliary transmission and front-wheel drive unit mounted on rear of transmission case. Separate control levers provided for Low-High range (right hand lever), and front-wheel drive engagement (left hand lever).

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Removal: Remove transmission and transfer case as an assembly. Remove transmission floor cover, remove shift lever by unscrewing control housing cap and withdrawing lever. Remove transfer case shift lever pivot pin setscrew and lubricator fitting in right end of shaft, drive out shaft and remove shift levers. Remove exhaust pipe guard and exhaust pipe clamp on skid plate, remove skid flanges at transfer case end. Disconnect front and rear propeller shafts at transfer case universal joints, tie propeller shafts up to frame. Place support jack under engine oil pan. Disconnect speedometer cable at transfer case, remove transfer case rubber snubber bolt nut on right hand side of cross-member. Remove clevis pin in lower end of hand brake cable, remove hand brake retracting lever. Disconnect engine stay cable at cross-member, bonding strap on transmission and transfer case, and clutch pedal pull back spring. Remove nuts on engine rear support insulator studs at cross-member. Place second support jack under transmission. Remove frame-to-cross member bolts at each end and remove cross-member. **CAUTION**—With cross-member removed, entire engine and transmission weight will be supported on the jacks. Push transmission to right until clutch control cross-shaft can be freed from ball stud end on transfer case. Remove inspection cover on bell housing, disconnect and remove clutch fork and cable assembly. Remove four transmission mounting bolts in bell housing, slide transmission straight back until clutch shaft clears bell housing (lower jack under engine just enough so that transmission will clear floor pan), lower transmission and remove from beneath car.

FRONT AXLE: Spicer 25. Full-floating, Hypoid Differential assembly (ring & pinion gear assembly) is identical with Rear Axle and is serviced in the same manner.

Ratio—4.88-1 Std.

Backlash—.005-.007". Shim adjustment.

Wheel Bearing Adjustment: Jack up the front wheel, remove the hub cap, then remove axle shaft nut, washer, and driving flange (use puller to remove flange). Bend lip of adjusting nut lockwasher back to free nut, remove locknut. Tighten adjusting nut until wheel binds (turn wheel while tightening nut), back off nut 1/6 turn or until wheel rotates freely. Replace lockwasher and locknut, tighten locknut securely and bend ear of lockwasher up against nut to prevent loosening in service. Check adjustment of bearings by grasping front and rear of tire and shaking wheels from side to side. A barely perceptible shake should be felt in the bearings. Install flange shims and flange. On cars with Bendix Universals, check axle shaft endplay (below) before completing assembly. **NOTE**—On cars with Rzeppa Universals, disregard endplay note below and install shim pack of .060" under flange.

Axle Shaft Endplay Check (With Bendix Universal Joints)—Tighten the flange nut (do not install lockwasher), swing wheel to maximum left or right position with punchmark on end of axle shaft straight up or down. Back off flange nut until clearance between nut and flange is .050" (measure with feeler gauge). Tap end of shaft with a soft hammer (shaft will move in an amount equal to the endplay). Recheck clearance between nut and flange with a feeler gauge. Subtract this measured clearance from the original .050" clearance. If resulting

figure is less than .015", add shims to shim pack under flange, if figure is more than .035", remove shims from shim pack under flange. With correct thickness of shim pack under flange, install axle shaft lockwasher, nut, and cotter pin.

REAR AXLE: Spicer 23-2. Full-floating, hypoid gear type with Hotchkiss Drive.

Ratio—4.88-1 Std.

Backlash—.005-.007". Shim adjustment.

Removal: Support rear end of car securely with a chain hoist and support placed under frame ahead of rear springs, remove rear wheels. Disconnect rear shock absorbers, rear brake line (at frame connection), and propeller shaft by removing universal joint "U" bolts at axle end of shaft. Place support jacks under axle housing so that springs relieved of weight, remove nuts on spring center clip "U" bolts, remove pivot bolts at front end of springs and lower the springs, remove axle assembly from beneath the car.

INSTALLATION CAUTION—Bleed brake lines after axle re-installed and lines connected.

Axle Shaft Removal: Remove six capscrews and washers holding axle shaft driving flange on wheel hub, thread two of these screws into "extra" holes (between regular mounting screw holes) and turn screws up evenly to pull axle shaft out, withdraw axle shaft from housing.

Wheel Bearing Adjustment: Remove the six axle shaft flange screws, turn two of these screws into "extra" holes in flange to start shaft, withdraw axle shaft. Adjust bearings in same manner as front wheels (above). When re-installing axle shaft, make certain that gasket installed under flange.

NOTE—Disregard the axle Shaft Endplay Check instructions required for front wheels only.

FRONT SUSPENSION: Spicer Model 25 Front Axle. Special driving unit with semi-elliptic springs.

See Front Suspension Specification Table on Page 38.

BRAKES: Service—Bendix (Lockheed) 4-wheel, Hydraulic, Double anchor type. Hand lever applies independent brake on drive shaft at rear of transfer case.

Drum Diameter—9".

Lining—Width 1 3/4". Thickness 3/16". Length per shoe 10 7/32" (forward shoes), 6 39/64" (rear shoes). **NOTE**—Manufacturer recommends use of new or replacement shoe assemblies with factory-installed linings.

Clearance—.008" toe, .005" heel, for each shoe.

Hand Brake: Mechanical type. External, contracting band on drum mounted on driveshaft at rear of transfer case.

Drum Diameter—8".

Lining—Woven type. Width 2". Thickness 5/32". Length 18 9/16".

Adjustment—Place hand brake lever under instrument panel in fully released position, check brake lever to make certain that cable is free and released. Remove brake band anchor adjusting screw lockwire, turn adjusting screw until .005" feeler is just snug between lining and drum at this point, re-install adjusting screw lockwire. Tighten adjusting nut (at lower end of large adjusting bolt) until brake band is tight on drum, loosen bracket bolt locknut and back off inner bracket bolt nut two turns, tighten locknut. Back off adjusting nut until brake band has approximately .010" clearance on drum at each end.

LINCOLN

HOOD LOCK: Hood is Alligator type. To raise hood, pull out lock button on left side of instrument panel, press in on safety catch under front edge of hood.

MODEL IDENTIFICATION

SERIAL & ENGINE NUMBER: Stamped on top of clutch housing (visible through opening in floor) and on left side of frame front cross-member near left front engine support.

TUNE-UP

COMPRESSION: Pressure—105-125 lbs. at cranking speed.

VACUUM READING: Steady 18-20" idling at 6 MPH.

FIRING ORDER: 1-4-8-5-2-11-10-3-6-7-12 with cylinders numbered 1-3-5-7-9-11—Left Bank, 2-4-6-8-10-12—Right Bank (front-to-rear).

SPARK PLUGS: Champion Type H-10. 14 mm. Metric. Gaps—.028-.030".

IGNITION: See Coil, Condenser, and Distributor.

Breaker Gap—.014-.016" (both sets equal).

Cam Angle or Dwell—36.5° closed, 23.5° open (each set—contacts operate independently).

Breaker Arm Spring Tension—20-24 ozs.

Rotation—Clockwise viewed from drive end.

Automatic Advance—Starts at 200 RPM. Max. advance 11-12° at 650 RPM (Distr. ° and RPM).

IGNITION TIMING: Std. Setting—4° BTDC.

Timing—No flywheel marks provided for Timing or synchronization on engine. Use Ford Test Set and Stroboscopic attachment or similar equipment. On Stroboscope, set Stroboscopic Disc at 37 1/2°, set Timing Index at 1° before top dead center, set peepsight at Zero. Adjust distributor by loosening adjusting screw in slot on right hand side of housing, move screw down (to retard spark), up (to advance spark) in slot until stroboscopic disc light is in line with peepsight. Synchronize contacts by removing adjusting screw and turning synchronizing screw in slot (movable set open 37 1/2° after fixed set).

Vacuum Brake Setting—Set to just eliminate ping with engine pulling load (back off adjusting screw until engine pings, then turn screw in just enough to eliminate pinging).

CARBURETION: See Carburetion.

Idle Setting—With engine warm, set throttle stop-screw for 6 MPH idle speed. Adjust idle adjusting screws (1 for each barrel—adjust in succession) for smooth idle (turn screws in for leaner mixture).

Float Level—Use 9550-A Ford gauge to set float level with 1/16" feeler between float and gauge 1.353" "Go," 1.322" "No Go." Fuel level in bowl should be 18/32-20/32" below top edge of bowl.

Accelerating Pump—Inner (#1) Hole—Summer, Center (#2) Hole—Winter, Outer (#3) Hole—extremely cold temperatures.

Fuel Pump Pressure: 1 1/2-3 1/2 lbs.

MANIFOLD HEAT CONTROL: Automatic thermostatic type. Located at exhaust pipe connection to exhaust manifold for left hand cylinder bank. See that valve operates freely.

VALVES: See Valve Timing.

Tappet Clearance—None in service. Zero-lash type hydraulic lifter used.

STARTING: See Battery, Starter, Generator, and Regulator.

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IGNITION

COIL: Ford No. H-12024 (Part of Ignition Unit Assy.). Two-coil unit mounted on distributor.
Primary Resistor—One resistor connected in series with each coil primary (two used). Resistors are part of Lighting Circuit Breaker Assy. 16H-11624.
Ignition Current—Approx. 3.2 amperes idling, 4.2 amperes stopped, for each coil. Primary circuit resistance 1.0-1.33 ohms.
CONDENSER: Ford Part No. H-12300 (two used). Capacity—30-.34 microfarad.
DISTRIBUTOR: Ford No. 16H-12127 (Less Coil, Distributor Caps, and Plates). Double breaker, 6 lobe cam, full automatic advance type with Vacuum Brake adjustment. Contacts open alternately at 37½° and 22½° intervals corresponding to unequal 75° & 45° firing intervals (must be synchronized). See Tune-Up for distributor specifications.
IGNITION TIMING: See Tune-Up for settings.

CARBURETION

CARBURETOR: Holley (Chandler-Groves) Ford No. 26H-9510-C. 1" Dual, Double-barrel, downdraft type with manual choke control.
 See Tune-Up for carburetor adjustment directions.
Metering Jet—No. 26H-9533 (.055"—2 used). Std.
FAST IDLE: Operated by choke lever (no adj.).
AIR CLEANER: Ford No. 26H-9625-A, 26H-9625-B (Cont'l.). Oil-bath type.
Servicing—Clean and refill with same grade engine oil used in crankcase (fill to level mark on case) at 5000 mile intervals, or more often if required by operating conditions. NOTE—Clean and re-oil filter element in oil filler cap at 1000 mile intervals.
FUEL PUMP: AC No. 1537709, Ford No. 26H-9350-A. Diaphragm type. Pressure—1½-3½ lbs.

ELECTRICAL

BATTERY: Ford No. 06H-10655-A. 6 volt, 17 plate, 120 Ampere Hour capacity (20 hour rate).
Grounded Terminal—Positive (+) terminal.
Location—Right hand side in engine compartment.
STARTER: Ford No. 18-11002. Armature 18-11005.
Drive—Bendix Drive, Ford No. B-11350.
Rotation—Counter-clockwise at commutator end.
Brush Spring Tension—Approx. 2 lbs.
Cranking Engine—100 RPM., 190-215 amperes.

Performance Data

Torque	R.P.M.	Volts	Amperes
4 ft. lbs.	1070	4.6	200
14 "	Lock	3.5	500

GENERATOR: Ford No. 21A-10000. Armature 01A-10005-A. Two brush (shunt) type with voltage and current regulation. Ventilated.
Maximum Charging Rate—30-33 amperes, 6.9-7.2 volts, 1200 RPM. (regulated voltage & current).

Performance Data

Amperes	Engine RPM
Start	520
30	1060
30	2500

Rotation—Counter-clockwise at commutator end.
Brush Spring Tension—Approx. 28 ozs.
Field Current—2.1 amperes at 6.0 volts.
Belt Adjustment—Loosen generator mounting bracket stud nut, raise generator until belt deflection midway between generator and water pump pulleys is 1" with thumb and finger pressure.

REGULATOR: Ford No. 11A-10505-C. 3-unit Type. Relay Closes—6.1-6.3 volts. Opens—8 amps. max. Voltage Setting—6.9-7.2 volts at 70-80°F.
Current Setting—30-33 amperes (hot).
Checking & Adjusting—See article in Electrical Equipment Section on this unit.
LIGHTING: Headlamps—Ford Sealed Beam type. Adjustment—Aim upper beam straight ahead (hot spot center 3" below lamp center height at 25').
Lamp Bulbs—See Specification Table on Page 31.
LIGHTING CIRCUIT BREAKER: Ford No. 16H-11624. Two vibrating circuit breakers which protect lighting circuits. Contacts open with 50 ampere current.
FUSES: Clock—3 ampere. In feed wire.
 Overdrive—20 ampere. In control relay lead.

ENGINE

ENGINE SPECIFICATIONS: 12 Cylinder, 75° Vee, "L" Head. Cylinder banks and crankcase cast Enbloc.
 Bore—2.937". Stroke—3.75".
 Displacement—305 cu.ins. Rated H.P.—41.4
 Developed Horsepower—130 at 3800 RPM.
 Compression Ratio—7.1-1 Std. Cast Iron Head.
PISTONS: Three-ring, Steel alloy, dome-head, cam ground type. Weight—442 grams.
Removal—Piston and rods removed from above.
Clearance—Fit new pistons with .002" feeler gauge, ½" wide, inserted between piston and cylinder wall. Pull required to withdraw feeler should be 3-6 lbs.
Replacement Pistons—Finished pistons furnished as follows:

	Nominal	Actual
26H-6110-A2	Standard	2.9357-2.9360"
26H-6110-A3	"	2.9362-2.9365"
26H-6110-A4	"	2.9368-2.9371"
26H-6110-A6	"	2.9380-2.9383"
26H-6110-A8	"	2.9392-2.9395"
26H-6110-D2	.020" Oversize	2.9557-2.9560"
26H-6110-D3	"	2.9562-2.9565"
26H-6110-D4	"	2.9568-2.9571"
26H-6110-C2	.030" Oversize	2.9657-2.9660"
26H-6110-C3	"	2.9662-2.9665"
26H-6110-C4	"	2.9668-2.9671"
26H-6110-E2	.040" Oversize	2.9757-2.9760"
26H-6110-E3	"	2.9762-2.9765"
26H-6110-E4	"	2.9768-2.9771"

PISTON RINGS: Width End Gap Side Clearance
 Compr. (#1) .093-.0935" .012-.017" .0025-.003"
 Compr. (#2) .093-.0935" .012-.017" .002-.0025"
 Oil (#3) .1845-.185" .008-.013" .0015-.002"
Installation Note—Expanders used with #2 Compression and Oil Rings.
Replacement Rings—Standard and Steel-section rings Std. Size & .020", .030", .040" Oversize.

PISTON PIN: Floating type (locking ring each end).
Clearance—.0001" in rod bushing, .0005" in piston or light hand push fit with piston at 70°F.

CONNECTING ROD BEARINGS: Removable, steel-backed, special alloy-lined type. No shims. Bearing shells have tangs which engage grooves in rod and cap. NOTE—See that long and short bearing cap bolts installed on correct side (rod split an angle).
Clearance—.001-.0025". Endplay—.014" total for both rods (side-by-side mounting).
Replacement Bearings—Std. Size and .0015", .003", .020", .040" Undersize.

Installing Rods—Marks on rods and bearing caps must be together and installed in same numbered cylinder with marks pointing down toward oil pan.
CRANKSHAFT BEARINGS: Removable, steel-backed, special alloy-lined type. No shims.

Clearance—.001". Endplay .002-.006" (rear).
Replacement Bearings—Std. size and .0015", .003", .020", .030", .040" Undersize.
CAMSHAFT SETTING: Mesh marked tooth of crankshaft gear with marked space between teeth on camshaft gear. Camshaft gear bolt holes offset.
VALVES Head Diam. Seat Angle Stem Clearance
 All Valves1.537".....45°......0015-.0035"
 Valve Spring Pressure—51-57 lbs. at 2.13" (closed), 111-121 lbs. at 1.84" (open).

VALVE TIMING

Valve Timing Check—No flywheel marks or other means provided to check valve timing. Intake valve opens with piston 10.42° BTDC (approx. 3.24 flywheel teeth before top dead center position).

LUBRICATION & COOLING

LUBRICATION: Crankcase Capacity—5 qts.
 Normal Oil Pressure—30-45 lbs. at 40 MPH.
 NOTE—New type oil pump has pressure regulator built in pump housing.
Oil Filter—Replace filter cartridge at 5000 mile intervals (Ford No. 01A-18662-A1).
COOLING: Capacity—26½ qts.
Pressure Valve—In filler cap. Opens at 3½-4½ lbs.
Thermostat—In outlet hose for each cylinder bank (two). Starts to open 150-155°F. Fully open 170°F.

MECHANICAL

CLUTCH: Long. Ford No. 26H-7563. Single plate, dry disc, semi-centrifugal type.
Pedal Adjustment—Free travel 1¼-2". Adjust by turning adjusting sleeve on connector link.
Facings—Woven I.D. 6". O.D. 10". Thickness .140".
OVERDRIVE: Warner Type R10A. Used with Ford Transmission. Overdrive is governor controlled, electrical solenoid operated (no centrifugal pawls) with throttle operated "kick-down" switch.
IMPORTANT SERVICE NOTE—Solenoid should be removed before transmission or overdrive removed from car (and installed after these units installed) and must be removed exactly as follows to avoid damage to unit: Disconnect wires at solenoid terminals, take out two mounting screws in base flange, rotate solenoid approximately 60° to right to disengage pawl rod from pawl (this will line up flats on end of rod with slot in pawl), withdraw solenoid and pawl rod assembly. To install solenoid, insert pawl rod in adapter with flats horizontal, make certain that short pilot on end of solenoid body enters counterbore in adapter casting, rotate solenoid approximately 60° to left to engage pawl rod in pawl and to line up solenoid flange mounting holes. Check engagement of pawl by attempting to pull solenoid out (solenoid should not come out and resistance of solenoid spring should be felt). Install solenoid mounting screws and connect wires.

FRONT SUSPENSION: Conventional front axle with transverse spring. See Specification Table on Page 38.

BRAKES: Bendix Hydraulic "No Eccentric" type. Hand lever applies rear wheel service brakes.
Clearance—.010" clearance at each end of each shoe (adjusting screw backed off 14 "clicks" from point where shoes drag on drum).
Drum Diameter—12".
Lining—Moulded (primary or forward shoes), Woven (secondary shoes). Width 1.75". Thickness .21", Length per shoe 11.95".

HOOD LOCK: Alligator hood. Release instrument panel button and safety catch under hood nose.

MODEL IDENTIFICATION

SERIAL NUMBER: First number K-77701. On plate on right body sill brace under engine hood.
Service Serial Number—First No. N4-78001. On plate on left front door hinge pillar post
ENGINE NUMBER: Stamped on left side of engine block at front end. First No. same as Serial No.

TUNE-UP

COMPRESSION: Pressure—120 lbs. at 350 RPM.
VACUUM READING: Steady 18-20" idling at 7 MPH.
FIRING ORDER: 1-5-3-6-2-4.
SPARK PLUGS: Auto-Lite AN-7. 14 mm. Metric. Gaps—.025".
IGNITION: See Coil, Condenser, and Distributor.
Breaker Gap—.020". Cam Angle—35° Closed.
Breaker Arm Spring Tension—17-20 ozs.
Rotation—Counter-clockwise viewed from above.
Automatic Advance—Starts 275 RPM., 45° at 400 RPM, Max. 11° at 1400 RPM. Distr. deg. & RPM
Vacuum Advance—Starts with 4" of vacuum, 75° max. with 15" of vacuum Distributor degrees.
IGNITION TIMING: Std. Setting—Top dead center. Timing Mark—"DC" mark on vibration dampener in line with pointer on timing chain cover.
Octane Selector—Set to give slight ping when accelerating with wide open throttle at 10-15 MPH
CARBURETION: See Carburetion.
Idle Setting—Set idle adjusting screw 1 1/4-2 1/4 turns open. Adjust for smooth idle. Idle speed 7 MPH.
Float Level—1/2" from top of projection on underside of bowl cover to top of seam on free end of float (invert bowl cover and float to check level).
Accelerating Pump—No seasonal adjustment.
Fuel Pump Pressure: 3 1/2 lbs maximum.
VALVES: Tappet Clearance—.015" All Valves, Hot.
STARTING: See Battery, Starter, Generator, and Regulator.

IGNITION

COIL: Auto-Lite No. IG-4677. Service Coil (less switch & cable) IG-3224JS. On dash, left side
Ignition Current—2 amperes idling, 5 stopped.
CONDENSER: Auto-Lite Part No. IGB-1025J. Capacity—.20-.25 microfarad.
DISTRIBUTOR: Auto-Lite Model IGW-4184 or 4184A. Automatic advance with Vacuum Spark Control and Octane Selector.
See Tune-Up for distributor specifications.
IGNITION TIMING: *See Tune-Up for settings.*

CARBURETION

CARBURETOR: Carter Type WA-1, Model 611S. 1 1/4" single barrel downdraft type with Carter Climatic Control Casting No. 298 on face of flange
See Tune-Up for carburetor adjustment instructions.
Metering Rod & Jet—Metering Jet No 120-17S (.096"). Standard Metering Rod No 75-584 Checking Gauge No T109-102 (2 468")
FAST IDLE: Setting—5/8" clearance between choke valve and air horn (Gauge T109-85) with throttle stop screw against (not on) first step of fast idle cam. Adjust by bending fast idle link offset.
AUTOMATIC CHOKE: Setting—Set coil housing 2 Notches Lean.

FUEL PUMP: AC. Type W. Exchange No. 532. Diaphragm type, fuel pump.

Pressure—3 1/2 lbs. maximum.

AIR CLEANER: AC. Oil-wetted type standard. Heavy duty Oil Bath type optional.

Servicing—Wash air cleaner and oil filler cap in gasoline and re-oil with engine oil every 2000 miles. On oil bath type, clean and re-fill with engine oil to indicated level as required by local operating conditions.

ELECTRICAL

BATTERY: Auto-Lite CT-1-13. 13 plate, 90 Amp. Hr. Grounded Terminal—Positive (+) to frame.

Location—On left side under front seat.

STARTER: Auto-Lite MZ-4103. Arm. No. MZ-2154. Drive—Barrel type Bendix No. A-2033.

Rotation—Counter-clockwise at commutator end.

Brush Spring Tension—42-53 ozs (new brushes)

Cranking Engine—150-175 amperes, 5.1 volts.

Performance Data

Torque	RPM.	Volts	Amperes
0 ft. lbs	4300	5.5	70
4.95 "	750	4.5	300
11.8 "	Lock	4.0	560

GENERATOR: Auto-Lite Model GDZ-4806A. Armature No. GDZ-2079F. Two brush (shunt) type with current voltage regulation (no adjustment at gen.).
Maximum Output—As given in table below.

Performance Data

Cold		Hot	
Ampere	Volts	R P M.	Amperes
0	6.4	925	0
8	6.75	1140	8
16	7.15	1370	16
24	7.5	1590	24
35	8.0	1900	35

Rotation—Counter-clockwise at commutator end.

Brush Spring Tension—35-53 ozs. (new brushes).

Field Current—1 60-1.78 amperes at 60 volts.

Belt Adjustment—3/4" belt deflection midway between pulleys. Adjust by raising fan bracket.

REGULATOR: Auto-Lite Model VRP-4004F-1. Current-Voltage type.

Relay Closes—6 4-7 0 volts (set to 6.4-6.6 volts).

Relay Opens—4 1-4.8 volts (4-6 amps. discharge).

Voltage Setting—7 2-7 5 volts at 70°F.

Current Setting—34-36 amperes (marked "35")

Checking & Adjusting—*See article in Electrical Equipment Section on this unit.*

LIGHTING: Headlamps—Sealed Beam type

Adjustment—Align upper beam straight ahead (hot spot center 3" below lamp center height at 25').

Lamp Bulbs—*See Specification Table on Page 31.*

FUSES: Lighting—30 ampere. On fuse block under hood on left side of dash.

Accessory—30 ampere. On fuse block

ENGINE

ENGINE SPECIFICATIONS: 6 cylinder, "L" head type.

Bore—3 1/8" **Stroke—**3 3/4".

Displacement—172 6 cubic inches. **Rated HP—**23.4.

Developed Horsepower—82 at 3800 RPM.

Compression Ratio—7.1-1 cast iron head.

PISTONS: 3 ring, aluminum alloy, cam ground, tin-plated, slotted type. Length—3 3/8".

Clearance—12-18 lbs. pull on .002" x 1/2" oiled feeler at right angles to pin hole, side opposite slot.

Removal—Pistons and rods removed from above.

Replacement Pistons—Std. size and .001", .002", .003", .005", .010", .012", .015", .020", .040" Oversize.

Installing Pistons—Slot to left.

PISTON RINGS: Width End Gap Side Clearance
 Compression .093" .010-.015" .002-.004"
 Oil Control .1865" .010-.015" .002-.004"

PISTON PIN: Floating type.

Clearance—Light push fit (piston at 200°F).

Replacement Pins—Standard, .001", .003" Oversize.

CONNECTING ROD BEARINGS: Steel-backed, bab-bitt lined type. No shims.

Clearance—.0015-.0025". Sideplay—.004-.008".

Rod Installation—Oil hole toward right.

Replacement Bearings—Std., .002", .010" undersize.

CRANKSHAFT BEARINGS: Steel-backed, bab-bitt lined type. No shims.

Clearance—.002". Endplay— .004-.006" (#1 bearing).

Replacement Bearings—Std, .002", .010" undersize.

VALVES: Head Diam. Seat Angle Stem Clearance
 Intake 1 15/32" 45° .002-.003"
 Exhaust 1 9/32" 45° .002-.003"
Valve Spring Pressure—83 lbs at 1 7/16".

LUBRICATION & COOLING

LUBRICATION: Crankcase Capacity—5 quarts.

Normal Oil Pressure—35 lbs. at 20 MPH.

Oil Filter—Optional. Renew every 8000 miles.

COOLING: Capacity—14 qts. (15 with heater).

Pressure Valve—In filler cap. Opens at 4 lbs.

Thermostat—In outlet elbow on cylinder head. Choke type. Starts to open at 160°F. If alcohol type anti-freeze used, 150° type thermostat is required.

MECHANICAL

CLUTCH: Borg & Beck Model 8A7. Single plate, dry disc type. Cover Assembly marked No. 975.

Facings—Woven (flywheel side), Molded (Pressure Plate side), I D. 5 3/8". O D. 8". Thickness 1/8".

Pedal Adjustment—1/2" minimum to 1" maximum pedal free travel. Adjust by loosening locknut and turning adjusting nut on connector link at clutch fork.

OVERDRIVE: Warner Type R7C with electrical "kick-down" throttle control.

Throttle Switch Setting—Adjust switch position on mounting bracket so that contacts close with throttle valve wide open and spring on carburetor throttle valve pulley just starting to compress.

FRONT SUSPENSION: New design, linked parallelogram type (upper & lower control arms) with coil spring. *See Specification Table on Page 38.*

BRAKES: Lockheed Hydraulic Double Anchor type. Hand lever applies rear wheel service brakes.

Clearance—.008" toe, .004", heel, for each shoe

Drum Diameter—9" Cast Iron type.

Lining—Molded. Width 1 3/4". Thickness 3/16" Length per wheel 20 1/2".

HOOD LOCK: Same as for Nash '600' preceding.

MODEL IDENTIFICATION

SERIAL NUMBER: First No. R-393101. Stamped on plate attached to top of right frame side rail just to rear of front shock absorber.

Service Serial Number—First number N6-86001. On plate on left front door hinge pillar post.

ENGINE NUMBER: Stamped on pad on right side of engine block at upper front corner. First number same as Serial Number.

TUNE-UP

COMPRESSION: Pressure—125 lbs. at 350 RPM.

VACUUM READING: Steady 18-20" idling at 7 MPH.

FIRING ORDER: 1-5-3-6-2-4.

SPARK PLUGS: AC No. 45. 14 mm. Metric type. Gaps—.025".

IGNITION: See Coil, Condenser, and Distributor.

Breaker Gap—.020". Cam Angle—38° closed.

Breaker Arm Spring Tension—17-20 ozs.

Rotation—Clockwise viewed from above.

Automatic Advance—Starts 350 RPM. 7° at 850 RPM. Max. 12° at 1350 RPM. Distributor degrees & RPM.

Vacuum Advance—Starts with 5" of vacuum, Max. 6" with 15" of vacuum. Distributor degrees.

IGNITION TIMING: Std. Setting—4° BTDC.

Timing Mark—"IGN" mark on vibrator dampener in line with pointer on timing chain cover.

CARBURETION: See Carburetion.

Idle Setting—Set idle adjusting screw 1/2-1 1/2 turns open. Adjust for smooth idle. Idle speed 7 MPH.

Float Level—3/8" from top of projection on underside of bowl cover to top of seam on free end of float (invert bowl cover and float to check level).

Accelerating Pump—Inner Hole (med. stroke) Normal, Lower hole (max.) winter, Upper (min.) Summer.

Fuel Pump Pressure: 3 1/2 lbs. maximum.

VALVES: Tappet Clearance—.015" Intake, .018" Exhaust, Hot.

STARTING: See Battery, Starter, Generator, and Regulator.

IGNITION

COIL: Auto-Lite No. CE-4662. Service Coil (less switch & cable) CE-3224JS. On dash.

Ignition Current—2 amperes idling, 5 stopped.

CONDENSER: Auto-Lite Part No. IG-2671F.

Capacity—.20-.25 microfarad.

DISTRIBUTOR: Auto-Lite Model IGS-4205A. Automatic advance with Vacuum Spark Control.

See Tune-Up for distributor specifications.

IGNITION TIMING: See Tune-Up for settings.

CARBURETION

CARBURETOR: Carter Type WA-1, Model 464S. 1 1/4" single barrel downdraft type with Carter Climatic Control. Casting No. 290 on face of flange.

See Tune-Up for carburetor adjustment instructions.

Metering Rod & Jet—Metering Jet No. 120-133S (.0995"). Standard Metering Rod No. 75-534. Checking Gauge No. T109-102 (2.468").

FAST IDLE: Setting—5/8" clearance between choke valve and air horn (Gauge T109-85) with throttle stop screw against (not on) first step of fast idle cam. Adjust by bending fast idle link offset.

AUTOMATIC CHOKE: Setting—Coil housing centered (to coincide with index mark).

FUEL PUMP: AC Type W. Exchange No. 533. Diaphragm type fuel pump. Type AD comb. fuel & vacuum pump optl.

Pressure—3 1/2 lbs. maximum.

AIR CLEANER: AC. Oil-wetted type standard. Heavy duty Oil Bath type optional.

Servicing—Wash air cleaner in gasoline and re-oil with engine oil every 2000 miles. On oil bath type, clean and re-fill with engine oil to indicated level as required by local operating conditions.

ELECTRICAL

BATTERY: Auto-Lite CT-1-15. 15 plate, 105 Amp. Hr. Grounded Terminal—Positive (+) to frame.

Location—On right side under front seat.

STARTER: Auto-Lite MAB-4076. Arm. No. MAB-2057. Drive—Inboard Bendix No. A-1660.

Rotation—Counter-clockwise at commutator end.

Brush Spring Tension—42-53 ozs. (new brushes).

Cranking Engine—160 RPM., 150-160 amps., 5.2 v.

Performance Data

Torque	RPM.	Volts	Amperes
0 ft.lbs.	3700	5.5	60
6.6 "	695	4.5	300
10.15 "	420	4.0	400
21.5 "	Lock	4.0	750

GENERATOR & REGULATOR: Auto-Lite. Same as used on "600" Model 4640. Refer to Model 4640 article (preceding page) for data.

LIGHTING: Headlamps—Sealed Beam type.

Adjustment—Aim upper beam straight ahead (hot spot center 3" below lamp center height at 25').

Lamp Bulbs—See Specification Table on Page 31.

FUSES: Lighting—30 ampere. On fuse block under hood on left side of dash.

Accessory—30 ampere. On fuse block.

ENGINE

ENGINE SPECIFICATIONS: 6 cylinder, valve-in-head type with Iso-thermal fuel intake system.

Bore—3 3/8". **Stroke**—4 3/8".

Displacement—234.8 cubic inches. **Rated HP**—27.3.

Developed Horsepower—112 at 3600 RPM.

Compression Ratio—7.0-1. Cast Iron Head.

PISTONS: 4 ring, aluminum alloy, cam ground, tin-plated, slotted type. **Length**—3 7/8".

Clearance—12-18 lbs. pull on .002" x 1/2" oiled feeler at right angles to pin hole, side opposite slot.

Removal—Pistons and rods removed from above.

Replacement Pistons—Std. size and .001", .002", .003", .005", .010", .012", .015", .020", .040" oversize.

Installing Pistons—Slot to left.

PISTON RINGS: Width End Gap Side Clearance
Compression124".....010-.015".....002-.004"
Oil Control155".....010-.015".....002-.004"

PISTON PIN: Floating type.

Clearance—Light push fit (piston at 200°F).

Replacement Pins—Standard, .001", .003" oversize.

CONNECTING ROD BEARINGS: Steel-backed, bab-bitt lined type. No shims.

Clearance—.0015-.0025". **Sideplay**—.008-.012"

Rod Installation—Oil hole toward right.

Replacement Bearings—Std., .002", .010" undersize.

CRANKSHAFT BEARINGS: Steel-backed, bab-bitt-lined type. No shims.

Clearance—.002-.003". **Endplay**—.004-.006" (taken at center bearing).

Replacement Bearings—Std., .002", .010" undersize.

VALVES: Head Diam. Seat Angle Stem Clearance

Intake1 3/4".....45".....002-.004"

Exhaust1 15/32".....45".....002-.004"

Valve Spring Pressure—Single spring now used (double springs formerly used).

Spring Pressure Spring Length

Valve Closed 65 lbs.1 11/16"

Valve Open146 lbs.1 11/32"

LUBRICATION & COOLING

LUBRICATION: Crankcase Capacity—8 quarts.

Normal Oil Pressure—20 lbs. at 20 MPH.

Oil Filter—Renew at 8000 mile intervals.

Cylinder Cover Vent—Vent on front end of cover provided for ventilation. Must be turned to open position at all times except when car operated in hot dusty areas. **CAUTION**—Make certain vent is open for Winter Operation.

COOLING: Capacity—17 qts. (18 with heater).

Pressure Valve—In filler cap. Opens at 4 lbs.

Thermostat—In outlet elbow on cylinder head. Choke type. Starts to open at 160°F. If alcohol type anti-freeze used, 150° type thermostat required.

MECHANICAL

CLUTCH: Borg & Beck Model 10A7. Single plate, dry disc type. Cover Assembly marked No. 950.

Pedal Adjustment—Pedal free travel should be 1/2" minimum. Adjusting nut provided on pedal to throw-out shaft lever connector link.

CAUTION—Pedal adjustment must be made exactly as outlined above to insure correct pedal travel and helper spring operation.

Facings—Spiral-woven type, 2 used. Inside Diameter 7". Outside Diameter 10". Thickness 1/8".

OVERDRIVE: All data same as given for Nash '600'.

FRONT SUSPENSION: Independent, parallelogram type with coil springs (same design as used on 1942 model). See Specification Table on Page 38.

BRAKES: Bendix Hydraulic "No Eccentric" type. Hand lever applies rear service brakes.

Clearance—.015" at each end of secondary (rear) shoe with primary shoe forced out against drum.

Drum Diameter—10" cast-iron type.

Lining—Moulded type. Width 2". Thickness 3/16". Length per wheel 22".

HOOD LOCK: Alligator hood. Pull out on control knob on instrument panel (hood will raise slightly), push up on "Safety Hook" tab under front end of hood.

MODEL IDENTIFICATION

	Six Cylinder	Eight Cylinder
Special Six	66	
Dynamic Cruiser	76	78
Custom Cruiser		98

SERIAL NUMBER: Stamped on plate on upper left hand corner of dash in engine compartment. First No. for each model and plant as follows (no letter for Lansing cars):

Series	Lansing	Linden	Calif.	Wilmington
66	66-112001	66L-14001	66C-12001	66W-1001
76	76-92001	76L-13001	76C-9001	76W-1001
78	78-33001	78L-5001	78C-5001	78W-1001
98	98-32001	98L-7001	98C-5001	98W-1001

ENGINE NUMBER: First No. 6-1001 (66, 76 LHD), 6R-1001 (66, 76 RHD), 8-1001 (78, 98). Stamped on pad on front left top corner of cylinder block above generator. NOTE—Cars with Hydra-Matic Drive have suffix "H" thus: 6-1001H.

TUNE-UP

COMPRESSION: Pressure—115 lbs. (six cylinder), 107 lbs. (eight) at cranking speed of 100 RPM.

VACUUM READING: Steady 17" min. at idling speed.

FIRING ORDER: 1-5-3-6-2-4 (six cylinder engine), 1-6-2-5-8-3-7-4 (eight cylinder engine).

SPARK PLUGS: AC No. 48. 14 mm. Metric type. Gaps—.040" (Six), .030" (Eight).

IGNITION: See Coil, Condenser, and Distributor.

Breaker Gap—.020" (6 cyl.), .015" (8 cyl.).

Cam Angle or Dwell—35° closed, 25° open (6 cyl.), 31° closed, 14° open (8 cyl.).

Breaker Spring Tension—17-21 ozs. (6), 19-23 (8).

Rotation—Counter-clockwise viewed from above.

Automatic Advance—Starts at 200 RPM (Six), 300 RPM. (Eight), Maximum 11-12° at 1600 RPM. (All models). Distr. degrees & RPM. in each case.

Vacuum Advance (Six)—Starts with 7½-9½" of HG., Maximum 6° (Distr.) with 16½-18½" of HG.

Vacuum Advance (Eight)—Starts with 6½-8½" of HG. Maximum 6° (Distr.) with 16-18" of HG.

IGNITION TIMING: Std. Setting—TDC. (Six cyl.), 2° BTDC. (Eight cylinder), .001" BTDC (Hydra-Matic 6 & 8).

Timing Mark—Steel ball insert in flywheel lined up with pointer in inspection hole in left front face of flywheel housing beside starter.

Octane Selector—Set to give slight ping accelerating with wide open throttle below 15 MPH.

CARBURETION (SIX): See Carburetion—6 cylinder.

Idle Setting—Set idle adjusting screw ½-1½ turns open. Adjust for smooth idle. Idle speed 6 MPH. or 425 RPM. (std.), 375 RPM. (Hydra-Matic cars).

Float Level—½" from machined projection on cover to top of soldered seam at free end (invert to check).

Accelerating Pump—Lower hole Normal setting. Upper hole (max.) winter. Inner hole (min.) summer.

Fuel Pump Pressure: 5 lbs. maximum.

CARBURETION (EIGHT): See Carburetion—8 Cyl. **Idle Setting**—Set idle adjusting screws ½-2¼ turns open. Adjust for smooth idle. Idle speed 6 MPH. or 425 RPM. (std.), 375 RPM. (Hydra-Matic cars).

Float Level—3/16" from top of float to machined surface of cover (remove gasket, invert to check).

Accelerating Pump—No seasonal adjustment.

Fuel Pump Pressure: 5 lbs. maximum.

MANIFOLD HEAT CONTROL: Thermostatic coil type. **Setting**—Coil wind-up should be 125° or approx. ½ turn (Six cyl.), 160° or approx. ½ turn (Eight cyl.) at room temperature. NOTE—To check valve for correct position on shaft, use feeler gauge in slot on rear end of valve shaft. With valve closed, gauge should contact stop pin (slot 6° to left or toward engine from up-and-down position) with ⅛" clearance between valve tip and manifold.

VALVES: See Valve Timing.

Tappet Clearance—.008" Int., .011" Exh., Hot.

STARTING: See Battery, Starter, Generator, and Regulator.

IGNITION

COIL: Delco-Remy No. 1115129. On dash.

Ignition Current—2.0 amperes idling, 4.5 stopped.

CONDENSER: Delco-Remy 1869704.

Capacity—.18-.25 microfarad.

DISTRIBUTOR: Delco-Remy No. 1110213 (Six cyl.), No. 1110808 (Eight cyl.). Automatic advance types with Vacuum Spark Control and Octane Selector. See Tune-Up for distributor specifications.

IGNITION TIMING: See Tune-Up for settings.

CARBURETION

SIX CYLINDER MODELS

CARBURETOR: Carter Vacumeter Type WA-1, Model 504S (Std. transmission), 481S (Hydra-Matic Drive cars). 1½" single barrel downdraft types with Carter Climatic Control, Casting No. 340 on flange. See Tune-Up for carburetor adjustment instructions.

Metering Rod & Jet—Metering Jet No. 120-15S (.1015"). Standard Metering Rod No. 75-487. Checking Gauge No. T109-102 (2.468").

THROTTLE CRACKER: Setting—.0625-.0825" (1/16") clearance between throttle stopscrew and highest step of fast idle cam with starting pedal fully depressed (starter pinion fully meshed). Adjust by loosening locknut and turning adjusting screw on accelerator bellcrank (screw contacts lug on lever linked to starter pinion shift lever).

CAUTION—Engine will not start properly if this adjustment not correctly made.

FAST IDLE: Setting—⅝" clearance between choke valve and air horn (gauge T109-85) with throttle stopscrew against (not on) first step of fast idle cam. Adjust by bending fast idle link offset.

AUTOMATIC CHOKE: Setting—Coil housing centered (to coincide with Index mark).

FUEL PUMP: AC type AJ. #1537358. Exchange No. 536. Combination fuel-and-vacuum pump. Pressure—5 lbs. maximum.

AIR CLEANER: AC oil-wetted type standard. Heavy duty Oil bath type optional.

Servicing—Wash and re-oil oil-wetted type every 2000 miles (500 to 1000 miles for dusty conditions). For Oil bath types, wash element and re-fill with 1 pint S.A.E. 50 oil (S.A.E. 40 for winter temperatures) every 5000 miles (2500 miles or oftener as required by local conditions in dusty areas).

CARBURETION

EIGHT CYLINDER MODELS

CARBURETOR: Carter Vacumeter Type WDO, Model 503S (Std. transmission), 480S (Hydra-Matic Cars). 1½" dual barrel downdraft type with Carter Climatic Control, Casting No. 342 on face of flange. See Tune-Up for carburetor adjustment instructions.

Metering Rod & Jet—Metering Jet No. 120-103S (.089"). Standard Metering Rod No. 75-486. Checking Gauge No. T109-113 (2.280").

THROTTLE CRACKER: .105-.125" (⅛") clearance between throttle stopscrew and carburetor casting with starting pedal fully depressed (starter pinion fully meshed). Adjust in same manner as Six (above). **CAUTION**—Engine will not start properly if this adjustment not correctly made.

FAST IDLE: Setting—With choke valve closed, adjust fast idle screw for .015" throttle valve opening or for clearance of .030" (503S), .025" (480S) between throttle stopscrew and stop on carburetor casting.

AUTOMATIC CHOKE: Setting—Set coil housing at index mark (503S), 2 points Rich (480S).

FUEL PUMP: AC type AJ. #1537330. Exchange No. 535. Combination fuel-and-vacuum pump.

Pressure—5 lbs. maximum.

AIR CLEANER: Same as for Six cylinder (above).

ELECTRICAL

BATTERY: (6 Cyl.) Delco 15E2. 15 plate, 100 A. H. (8 Cyl.) Delco 17E2. 17 plate, 120 Ampere Hour. Grounded Terminal—Negative (—) to starter. Location—Under engine hood on left side.

STARTER: Delco-Remy 1107034 (66, 76 Std.), 1107922 (78 Std.), 1107930 (98 Std.; 66, 76, 78 Optl.). Armature—Delco-Remy 1867897 (all models).

Drive—Manual pinion shift (1107034 & 1107922), solenoid pinion shift (1107930) and overrunning clutch. NOTE—Safety Switch used with 1107930 starter on Hydra-Matic Drive cars prevents starter operation unless Selector Lever in NEUTRAL.

Rotation—Counter-clockwise at commutator end.

Brush Spring Tension—24-28 ozs.

Cranking Engine—100 RPM (summer temperature), 125-135 amps. (6), 140-150 amps. (8), 5 volts.

Performance Data—1107034

Torque	R.P.M.	Volts	Amperes
0 ft. lbs.	5000	5.0	65
12 " "	Lock	3.37	525

Performance Data—1107922

Torque	R.P.M.	Volts	Amperes
0 ft. lbs.	6000	5.0	60
15 " "	Lock	3.0	600

Performance Data—1107930

Torque	R.P.M.	Volts	Amperes
0 ft. lbs.	5500	5.0	65
15 " "	Lock	3.0	600

Safety Switch Adjustment—Place Selector Lever in "N" (neutral) position, loosen safety switch bracket locking screw, adjust switch so clearance between lever and stop is 1/16-3/32".

GENERATOR: Delco-Remy Model 1102664 (Std.), 1102680 (With Hydra-Matic Drive). Arm. #1879002. Two brush (shunt) type with Current-Voltage regulation (no adjustment at generator).

Maximum Output—33 amperes, 7.75 volts, 2400 RPM or 21 MPH and up with generator Hot.

Performance Data

	Amperes	Volts	R.P.M.
Cold	30	8.0	1750

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Rotation—Counter-clockwise at commutator end.
Brush Spring Tension—25 ozs.
Field Current—1.67-1.82 amperes at 6.0 volts.
Belt Adjustment— $\frac{3}{4}$ " belt deflection at center.
REGULATOR: Delco-Remy 1118242 or 1118201. Single Core type current-voltage regulator.
Relay Closes—6.2-6.7 volts hot. **Opens**—0-4 amperes.
Voltage Setting—7.2-7.4 volts hot (operating temp.).
Current Setting—32-34 amps. hot (operating temp.).
Checking & Adjusting—See article in *Electrical Equipment Section on this unit.*
LIGHTING: Headlamps—Sealed Beam type.
Adjustment—Aim upper beam straight ahead (hot spot center 3" below lamp center height at 25').
Lamp Bulbs—See *Specification Table on Page 31.*
THERMOSTATIC RELAY: On lighting switch. Remains closed with 30 amperes. Opens within 3 minutes with 42 amperes at 70°F. Not adjustable.
FUSES: Dome and Stop Lights—SFE 9 amperes. On lighting switch.
Electric Clock—1AG 2 amperes. In feed wire.
Direction Signal—SFE 9 ampere type.

ENGINE

SIX CYLINDER ENGINE SPECIFICATIONS: 6 cylinder "L" head type.
Bore— $3\frac{1}{2}$ ". **Stroke**— $4\frac{1}{8}$ ".
Displacement—238.1 cubic inches. **Rated HP**—29.4.
Developed Horsepower—100 at 3400 RPM.
Compression Ratio—6.5-1 cast-iron head.
EIGHT CYLINDER ENGINE SPECIFICATIONS: 8 cylinder, "L" head type.
Bore— $3\frac{1}{4}$ ". **Stroke**— $3\frac{7}{8}$ ".
Displacement—257.1 cubic inches. **Rated HP**—33.8.
Developed Horsepower—110 at 3600 RPM.
Compression Ratio—6.5-1 cast-iron head.
PISTONS: 4 ring, aluminum alloy, T-slot, cam ground, Oxalic sulphuric acid coated.
Length— $4\frac{1}{32}$ " (Six), $3\frac{15}{16}$ " (Eight).
Weight—Stripped: $18\frac{1}{2}$ ozs. (6), 16 ozs. (8).
Clearance—Top .023-.028". Bottom of skirt .00075" (Six), .00155" (Eight) or 4 to 11 lbs. pull on .002" x $\frac{1}{2}$ " feeler on thrust side of piston (90° from pin hole on side opposite slot).
Removal—Pistons and rods removed from above.
Replacement Pistons—.003", .005", .010", .015", and .030" oversize.
Installation—Slot away from valves.
PISTON RINGS:

	Width	6 Cyl.	8 Cyl.	Side Clearance
Compr.	$\frac{3}{32}$ "	.008-.018"	.009-.014"	.001-.003"
Oil Contr.	$\frac{3}{16}$ "	.007-.015"	.009-.014"	.001-.0025"

NOTE—Install compression rings with mark TOP up.
Replacement Rings—.010", .020", .030" oversize.
PISTON PIN: Locked in one piston pin boss.
Clearance—In piston .0001" loose to .0002" tight (plain boss), .0002-.0005" tight (lock boss). In rod .0003-.0006".
CONNECTING ROD BEARINGS: Steel-backed, Durex Babbitt overlay. No shims.
Clearance—.0005-.0025". **Sideplay**—.0055-.0105".
Rod Installation—Oil spit hole toward camshaft.
CRANKSHAFT BEARINGS: Steel-backed, Durex Babbitt overlay. No shims.
Clearance—.0005-.002" (Rear), .001-.003" (Others).
Endplay—.004-.008" taken at front bearing.
CAMSHAFT SETTING: Marks on both sprockets adjacent and in line with straightedge across centers.

VALVES

	Head Diam.	Seat Angle	Stem Clearance
Intake	$1\frac{9}{16}$ "	30°	.00175-.00375"
Exhaust	$1\frac{27}{64}$ "	45°	.00245-.00425"

Valve Spring Pressure—55 lbs. at $2\frac{1}{4}$ " (valve closed), 100 lbs. at $1\frac{15}{16}$ " (valve open).

VALVE TIMING

Valve Timing Check (6 Cylinder)—With .0124" tappet clearance, #1 intake valve opens 5° (.0163") BTDC. with flywheel TDC mark (steel ball insert) approx. 2 teeth before indicator in inspection hole on left side of housing. Reset tappet clearance at .008" hot.
Valve Timing Check (8 Cylinder)—With .0124" tappet clearance, #1 intake valve opens at TDC with steel ball insert on flywheel slightly ahead of indicator in inspection hole on left side of housing. Reset tappet clearance at .008" Int., .011" Exh., Hot.
FLYWHEEL MARK CAUTION—Steel ball insert indicates TDC on Six Cylinder, 2° BTDC. on Eight Cylinder.

LUBRICATION & COOLING

LUBRICATION: Crankcase Cap. 5 qts. (6), 6 qts. (8).
Normal Oil Pressure—30 lbs.
COOLING: Capacity— $18\frac{1}{2}$ qts. (6), $20\frac{1}{2}$ qts. (8).
Thermostat—In outlet elbow on cylinder head. By-pass type. Starts to open at 152°F.

MECHANICAL

CLUTCH: Borg & Beck 9A7 (6 Cyl.), 10A7 (8 Cyl.). Single plate type. Cover number 924 (6 Cyl.), 927 (8 Cyl.). **HYDRA-MATIC CARS**—No clutch used.
Facings—Woven, 2 used. Inside Diameter 6" (6), 7" (8). Outside Diameter $9\frac{1}{4}$ " (6), 10" (8). $\frac{1}{8}$ " thick.
Pedal Adjustment—Free travel $1\frac{1}{4}$ ". Turn link at clutch fork in or out of clevis on auxiliary shaft.
HYDRA-MATIC DRIVE: Optional on all models.
Linkage Adjustment—Make all adjustments in order and exactly as follows:
Manual Control—Disconnect lower control relay rod at lever on side of transmission case and lower control rod at intermediate lever on cross-member bracket (remove clevis pins and spring washers, loosen clevis locknuts). Move manual control lever on transmission to reverse position (all the way back against stop—rotate propeller shaft by hand until anchor engages and lever is against stop). Position intermediate lever so that gaging hole lines up with hole in bracket, insert locking pin (Tool J-1469) through both holes to lock lever in position. Adjust clevis on lower control relay rod so that rod can be connected without disturbing position of transmission lever, connect rod (CAUTION—use spring washer on clevis end to prevent rattles), remove locking pin from intermediate lever. Move manual lever on transmission to "LO RANGE" position (move lever all the way forward to "Neutral", then move lever back to second detent position). Place Selector lever against stop which prevents shifting into reverse (without raising lever) by pulling down on lower control rod until stop is felt. Adjust clevis on lower end of control rod so that clevis pin can be inserted without disturbing position of selector lever or intermediate lever, then lengthen rod by turning clevis one full turn, connect rod to intermediate lever (CAUTION—use spring washer on clevis end to prevent rattles).
Throttle Control—Make this adjustment with engine idling speed properly set at 375 RPM (slow

idle speed) and with transmission in Neutral. Remove small spring lock from trunnion on idler lever (on cylinder head above oil filler cap), adjust length of carburetor rod by turning trunnion adjusting nut until locking pin (Tool J-1469) slips freely through holes in bell-crank (on side of engine block below trunnion) and indexing plate with carburetor throttle lever in slow-idle position, tighten trunnion locknut and position adjusting nut so that trunnion spring lock can be replaced. **CAUTION**—If tightening trunnion locknut changes alignment of gaging holes (recheck alignment with Tool J-1469), loosen locknut and lengthen rod one-half turn, tighten locknut and recheck alignment. Make sure carburetor rod moves freely in idle and full-throttle positions. Install trunnion spring lock. Disconnect rod at throttle lever on side of transmission case, move throttle lever all the way back against stop, make certain that carburetor throttle in slow-idle position and adjust clevis on rod so that it can be connected to throttle lever on transmission without disturbing position of lever and linkage, then shorten rod by turning clevis one full turn, connect rod to lever. Adjust accelerator pedal rod so that idler lever under toeboard (to which pedal rod connected) will have $3/32$ - $5/32$ " clearance between lever and rib in body toe pan. **CAUTION**—This clearance necessary to allow carburetor to return to slow idle position.

Throttle Cracker Adjustment—See adjustment directions in Tune-up section for instructions.

Fourth-to-Third Throttle Downshift—Should be checked whenever linkage adjusted to insure proper operation and prevent damage to linkage. To adjust with engine stopped, pull transmission throttle rod all the way forward until throttle lever on transmission is against stop, hold in this position and bend stop lip on indexing plate (at bell-crank on side of engine) for clearance of $1/16$ - $3/32$ " between lip and stop on bell-crank.

Lubrication—Check fluid level in transmission at 2000 mile intervals, drain and refill at 15000 mile intervals. Use only "Hydra-Matic Fluid."

Checking & Adding Fluid—Raise right edge of front floor mat and remove sheet metal cover for access to dip stick (CAUTION—Clean area thoroughly before removing dip stick). Run engine at idling speed when checking level, add fluid as necessary to keep level at "FULL" mark on dip stick.

Draining & Refilling—Fluid coupling and transmission case must both be drained (remove clutch housing underpan for access to fluid coupling drain plug). After drain plugs replaced, place 7 qts. of fluid in transmission case, run engine for several minutes, then add 4 qts. fluid additional to bring level up to "FULL" mark on dip stick.

Capacity—11 qts. (when fluid coupling and transmission case drained), 12 qts. (when transmission overhauled and reassembled).

FRONT SUSPENSION: Independent parallelogram type with coil springs. See *Specification Table Page 38.*

BRAKES: Bendix Hydraulic "No Eccentric" type. Hand lever applies rear wheel service brakes.

Clearance—.015" at both ends of secondary (rear) shoe with primary shoe forced out against drum. **Drum Diameter**—11" cast-iron lined steel type.

Lining—Moulded. Width: Front wheel 2" (6), $2\frac{1}{4}$ " (8), Rear wheel $1\frac{3}{4}$ " (6), 2" (8). Thickness $3/16$ ". Length per shoe: $9\frac{11}{32}$ " (primary), $11\frac{31}{32}$ " (secondary).

ELECTRICAL EQUIPMENT NOTE: Both Auto-Lite and Delco-Remy electrical equipment are used.

HOOD LOCK: One-piece side hinge hood. To raise hood, release lever under instrument panel on side to be raised, lift hood slightly, release safety catch (approx. 2 ft. from rear edge of hood), raise hood, hold in open position with prop on dash.

MODEL IDENTIFICATION

SERIAL NUMBER: On left side of cowl (use Eng. No.).

ENGINE NUMBER: First number F1501. On upper left side of cylinder block between #3 and #4 cylinders.

TUNE-UP

COMPRESSION: Pressure—118 lbs. at cranking speed.

VACUUM READING: Steady 18-20" idling at 6 MPH.

FIRING ORDER: 1-5-3-6-2-4.

SPARK PLUGS: AC No. 104 or Champion Y4-A. 10 mm. Gaps—.028" (.0255-.0305").

NOTE: Tighten spark plugs to 50 inch lbs. only.

IGNITION: See Coil, Condenser, and Distributor.

Breaker Gap—.020". Limits .018-.022".

Cam Angle—Closed 38° Auto-Lite, 35° Delco-Remy.

Rotation—Counter-clockwise viewed from above.

Automatic Advance—Start 300 RPM, Max. 9½° (Auto-Lite), 10¼° (Delco-Remy) at 1600 RPM. Distr. ° & RPM.

Vacuum Advance—Starts with 6" of HG., 7½° Max. with 17" of HG. Distributor degrees.

IGNITION TIMING: Std. Setting—4° BTDC.

Timing Mark—Vibration dampener at front of engine marked "#1 UP.DC" with fifteen 1° graduations before this point. Set ignition contacts to open at 4th graduation before "DC" mark.

Fuel Compensator—Set for slight ping accelerating with wide open throttle. **NOTE:** Auto-Lite distributor adjusted by shifting vacuum link on quadrant.

CARBURETION: See Carburetion.

Idle Setting—Set idle adjusting screw ½-1½ turns open. Adjust for smooth idle. Idle speed 6 MPH.

Float Level—¾" from projection on bowl cover to top of float seam at free end (invert to check).

Accelerating Pump—No seasonal adjustment.

Fuel Pump Pressure: 4 lbs. maximum.

MANIFOLD HEAT CONTROL: Thermostatic coil type. Make certain that valve operates freely and does not bind or stick. Do not oil control.

VALVES: See Valve Timing.

Tappet Clearance—.007" Intake, .010" Exh., Hot.

STARTING: See Battery, Starter, Generator and Regulator.

IGNITION

AUTO-LITE

COIL: Auto-Lite No. CE-4659. Service Coil (less switch & cable) CE-3224US. On dash.

Ignition Current—2.75 amperes idling, 5 stopped.

CONDENSER: Auto-Lite Part No. IGW-3128.

Capacity—.28-.32 microfarad.

DISTRIBUTOR: Auto-Lite No. IGC-4505. Automatic advance with vacuum Spark Control and Fuel Compensator.

See Tune-Up for distributor specifications.

IGNITION TIMING: *See Tune-Up for settings.*

IGNITION

DELCO-REMY

COIL: Delco-Remy No. 1115001. Mounted on dash.

Ignition Current—2.75 amperes idling, 5 stopped.

CONDENSER: Delco-Remy Part No. 1869704.

Capacity—.18-.25 microfarad.

DISTRIBUTOR: Delco-Remy No. 1110092. Automatic advance with Vacuum Spark Control and Fuel Compensator.

Rotation—Counter-clockwise viewed from above.

See Tune-Up for distributor specifications.

IGNITION TIMING: *See Tune-Up for settings.*

CARBURETION

CARBURETOR: Carter Vacumeter Type WA-1, Model 530S. 1¼" single barrel downdraft type with Carter Climatic Control and Carter Car Starter. Casting No. 317.

See Tune-Up for carburetor adjustment instructions.

Metering Rod & Jet—Metering Jet No. 120-15S (.1015"). Standard Metering Rod No. 75-535. Checking Gauge No. T109-102 (2.468").

FAST IDLE: Setting—⅝" clearance between choke valve and air horn (Gauge T109-85) with throttle stop screw against (not on) first step of fast idle cam. Adjust by bending fast idle link offset.

AUTOMATIC CHOKE: Setting—Coil housing centered to coincide with Index mark.

FUEL PUMP: AC type AT. Exchange No. 524. Diaphragm type.

Pressure—4 lbs. maximum.

AIR CLEANER: AC oil-wetted type standard, heavy duty oil bath type optional.

Servicing—Clean and re-oil air cleaner and oil filler cap when changing crankcase oil. On oil bath types, clean element and re-fill with S.A.E. 50 (summer), S.A.E. 30 (winter) oil to indicated level (approximately 1 pint).

ELECTRICAL

AUTO-LITE

Auto-Lite Equipment—Same units as used on Packard 8. *See Packard 8 article (following) for Auto-Lite data.*

ELECTRICAL

DELCO-REMY

BATTERY: Auto-Lite P-15-ZR or Willard SW-1D-100. 15 plate, 100 ampere hr. capacity (20 hr. rate).

Grounded Terminal—Positive (+) terminal.

Location—Under hood on left side of car.

STARTER: Delco-Remy 1107056. Armature 1878077.

Drive—Outboard Barrel type Bendix No. A-1792.

Brush Spring Tension—24-28 ozs.

Rotation—Counter-clockwise at commutator end.

Cranking Engine—125 RPM., 150 amperes, 5 volts.

Performance Data

Torque	R.P.M.	Volts	Amperes
0 ft. lbs.	5000	5.0	65
12 "	Lock	3.37	525

Vacuum Switch: Carter Car Starter No. 192-11U. Mounted on carburetor, operated by throttle shaft.

Setting—Same as for 1942 type. *See Carter Car Starter article in the Electrical Equipment Section.*

GENERATOR: Delco-Remy 1102682. Armature 1879002. Two brush (shunt) type, current-voltage regulation. **Maximum Output**—34 amperes, 8.0 volts, 2400 RPM.

Performance Data

	Amperes	Volts	R.P.M.
Cold	30	8.0	1750

Rotation—Counter-clockwise at commutator end.

Brush Spring Tension—25 ozs

Field Current—1.67-1.82 amperes at 6.0 volts.

Belt Adjustment—50 lbs. tension on generator or ½" thumb pressure belt deflection between pulleys.

REGULATOR: Delco-Remy 1118202 Single Core type.

Relay Closes—6.2-6.7 volts hot, 800 Gen. RPM.

Relay Opens—0-4.0 amperes.

Voltage Setting—7.2-7.4 volts hot (operating temp.).

Current Setting—32-34 amperes hot.

Checking & Adjusting—*See article in Electrical Equipment Section on this unit.*

LIGHTING: Headlamps—Sealed Beam type.

Adjustment—Aim upper beam straight ahead (hot spot center 3" below lamp center height at 25').

Lamp Bulbs—*See Specification Table on Page 31.*

THERMOSTATIC RELAY: Delco-Remy—On lighting switch. Contacts remain closed with 30 amperes open in 3 minutes with 42 amperes at 70°F.

FUSES: Stop Light, Cigar Lighter, Body Lights—Two SFE 20 ampere fuses on lighting switch.

Instrument & Tail Light—SFE 20 ampere fuse on panel light switch.

Overdrive—SFE 30 ampere fuse in feed wire from starter to No. 1 terminal on Overdrive Relay.

Clock—SFE 4 ampere fuse in clock feed wire.

ENGINE

ENGINE SPECIFICATIONS: 6 cylinder, "L" head type.

Bore—3½". **Stroke**—4¼".

Displacement—245 cubic inches. **Rated HP**—29.4.

Developed Horsepower—105 at 3600 RPM.

Compression Ratio—6.71-1 cast-iron head.

PISTONS: 3 ring, aluminum alloy, autothermic strut, plated, cam ground type. **Length**—3⅞".

Weight—Stripped: 20¼ ozs. (6 & Super 8), 17¼ (8). With rings & pin: 26¾ (6 & Super 8), 23⅞ (8).

Clearance—.0005-.001" or 12-18 lbs. pull on .0015" by ½" feeler inserted on side opposite piston slot.

Removal—Pistons and rods removed from above.

Replacement Pistons—Furnished standard size and .010", .020", .030", .040" oversize.

PISTON RINGS:

Width	End Gap	Side Clearance
Comp. #1	.093-.0935"①	.007-.017"0025-.003"
Comp. #2	.1235-.124"	.007-.017"0025-.003"
Oil Control	.186-.1865"	.007-.015"0025-.003"

①—.0925-.0935" for Eight cylinder engine.

OIL RING NOTE—New type Perfect Circle type 86 oil ring used (has coil type expander spring behind ring).

Replacement Rings—Furnished standard size and .010", .020", .030", .040" oversize.

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PISTON PIN: Floating type.

Clearance (Six & Eight)—Push fit in piston at room temperature (80-130 lbs. per sq. in.).

Clearance (Super Eight)—Palm push fit in piston with piston heated to 160°F.

Replacement Pins—Std. and .003", .006" oversize

CONNECTING ROD BEARINGS: Detachable shell, Moraine (Durex No. 300) bearings. No shims

Clearance—.0005-.0015". **Sideplay**—.004-.010".

Rod Installation—Oil hole toward camshaft.

CRANKSHAFT BEARINGS: Detachable shell, Moraine (Durex No. 300) bearings. No shims.

Clearance—.0005-.0015". **Endplay**—.003-.008" at front bearing (6 cyl.), center bearing (8 & Super 8).

CAMSHAFT SETTING: Marks on both sprockets adjacent and in line with straightedge across centers.

VALVES: Head Diam. Seat Angle Stem Clearance
Intake 1 19/32" ① 30°0025"
Exhaust 1 3/8" 45°0045"
①—1 31/64" for Eight cylinder engine.

Valve Spring Pressure—52-57 lbs. at 1 5/8" (valve closed), 119-129 lbs. at 1 5/16" (valve open).

VALVE TIMING

Valve Timing Check—With .0125" tappet clearance #1 intake valve opens 1° BTDC (piston .0004" BTDC) or 1 graduation before "DC" mark on vibration dampener aligned with pointer. Reset tappet clearance at .007" Intake, .010" Exhaust, Hot.

LUBRICATION & COOLING

LUBRICATION: Crankcase Capacity—5 quarts.

Normal Oil Pressure—40 lbs. normal driving.

COOLING: Capacity—14 quarts.

Pressure Valve—In filler cap. Opens at 4½ lbs.

Thermostat—In outlet elbow on cylinder head. Opens at 145-150° (Std.), 160-165° (High Reading).

MECHANICAL

CLUTCH—Long Model 9½CF-CS. Semi-centrifugal type.

Facings—Woven (U. S. Asbestos). Inside Diameter 6", Outside Diameter 9½". Thickness .125".

Pedal Adjustment—1½-2" free travel. Adjust at clutch fork end of connector link.

OVERDRIVE: Governor controlled type.

Throttle Switch Setting—Adjust tappet screw on throttle lever to just contact switch plunger with throttle valve wide open (remove air cleaner on carburetor to observe throttle valve).

FRONT SUSPENSION: Independent parallelogram type with coil springs. See Specification Table Page 38.

BRAKES: Bendix Hydraulic "No Eccentric" type. Parking brake applies rear service brakes.

Clearance—.015" at both ends of secondary shoe with primary shoe forced out against drum.

Drum Diameter—12" (front), 11" (rear).

Lining—Marshall 2201H-8 (primary), B-50 (secondary). Width 1¾". Thickness 3/16". Length per shoe: Front wheel 11½" (primary), 13" (secondary); Rear wheel 10½" (primary), 12" (secondary).

PACKARD 8

HOOD LOCK: Same as for Packard Six.

MODEL IDENTIFICATION

SERIAL NUMBER: On left side of cowl (use Eng. No.)

ENGINE NUMBER: First number F300001. On upper left side of cyl. block between #3 and #4 cylinders.

TUNE-UP

COMPRESSION: Pressure—118 lbs at cranking speed.

VACUUM READING: Steady 18-20" idling at 6 MPH.

FIRING ORDER: 1-6-2-5-8-3-7-4.

SPARK PLUGS: AC No. 104 or Champion Y4-A. 10 mm.

Gaps—.028" (.0255-.0305").

NOTE—Tighten plugs to 50 inch lbs. only.

IGNITION: See Coil, Condenser, and Distributor.

Breaker Gap—.017". **Cam Angle**—27° Closed.

Breaker Arm Spring Tension—17-20 ozs.

Rotation—Counter-clockwise viewed from above.

Automatic Advance—Starts 325 RPM., 5.3° at 800 RPM., Max. 10.75° at 1500 RPM. Distr. ° & RPM.

Vacuum Advance—Starts with 10" of vacuum, Max. 6° with 17" vacuum. Distributor degrees.

IGNITION TIMING: Std. Setting—5° BTDC.

Timing Mark—Vibration dampener at front of engine marked "#1UP.DC" with fifteen 1° graduations before this point. Set ignition contacts to open at 5th graduation before "DC" mark.

Fuel Compensator—Set for slight ping accelerating with wide open throttle (shift link on quadrant).

CARBURETION: See Carburetion.

Idle Setting—Set both idle adjusting screws ½-1½ turns open. Adjust for smooth idle. Idle speed 6 MPH.

Float Level—5/32" from top of float to cover with valve seated (remove gasket and invert to check).

Accelerating Pump—Inner Hole (minimum) Normal, outer hole (max. stroke) if greater charge required.

Fuel Pump Pressure: 4¾ lbs. maximum.

MANIFOLD HEAT CONTROL: Thermostatic coil type. Make certain that valve operates freely and does not bind or stick. Do not oil control.

VALVES: See Valve Timing.

Tappet Clearance—.007" Intake, .010" Exh., Hot.

STARTING: See Battery, Starter, Generator and Regulator.

IGNITION

COIL: Auto-Lite No. CE-4659. Service Coil (less switch & cable) CE-3224US. On dash.

Ignition Current—2.4 amperes idling, 5 stopped.

CONDENSER: Auto-Lite Part No. IG-2671K.

Capacity—20-25 microfarad.

DISTRIBUTOR: Auto-Lite No. IGP-4502A. Automatic advance with Vacuum Spark Control and Fuel Compensator.

See Tune-Up for distributor specifications.

IGNITION TIMING: See Tune-Up for settings.

CARBURETION

CARBURETOR: Carter Vacumeter Type WDO, Model 512S. 1¼" dual barrel downdraft type with Carter Climatic Control and Carter Car Starter. Casting No. 371. See Tune-Up for carburetor adjustment instructions.

Metering Rod & Jet—Metering Jet No. 120-125S (.0846"). Standard Metering Rod No. 75-451. Checking Gauge No. T109-113 (2.280").

FAST IDLE: Setting—Adjust fast idle screw for .020" throttle opening (Gauge T109-29) with choke valve tightly closed.

AUTOMATIC CHOKE: Setting—Coil housing centered to coincide with Index mark.

FUEL PUMP: AC type AH. Exchange No. 525. Diaphragm type.

Pressure—4¾ lbs. maximum.

AIR CLEANER: AC oil-wetted type standard, heavy duty oil bath type optional.

Servicing—Clean and re-oil air cleaner and oil filler cap when changing crankcase oil. On oil bath types, clean element and re-fill with S.A.E. 50 (summer), S.A.E. 30 (winter) oil to indicated level (approximately 1 pint).

ELECTRICAL

BATTERY: Auto-Lite P-15-ZR or Willard SW-1D-100. 15 plate, 100 ampere hr. capacity (20 hr. rate).

Grounded Terminal—Positive (+) terminal.

Location—Under hood on left side of car.

STARTER: Auto-Lite Models MAW-4024 or MAW-4027. Armature No. MAW-2128.

Drive—Outboard Barrel type Bendix No. A-1792.

Rotation—Counter-clockwise at commutator end.

Brush Spring Tension—42-53 ozs. (new brushes)

Cranking Engine—125 RPM., 175 amperes, 5.1 volts.

Performance Data

Torque	R.P.M.	Volts	Amperes
0 ft. lbs.	4900	5.5	65
8.50 "	400	4.0	400
18.0 "	Lock	4.0	670

Vacuum Switch: Carter Car Starter No. 192-11U. Mounted on carburetor, operated by throttle shaft.

Setting—Same as for 1942 type. See Carter Car Starter article in the Electrical Equipment Section.

GENERATOR: Auto-Lite Model GDZ-4801F. Armature GDZ-2006F. Two brush (shunt) type with Current-Voltage regulation (no adjustment at generator). **Maximum Output**—35 amperes, 8 volts, at 1900 generator RPM. (cold).

Cold			Performance Data			Hot		
Amperes	Volts	R.P.M.	Amperes	Volts	R.P.M.	Amperes	Volts	R.P.M.
0	6.4	925	0	6.4	1000			
8	6.75	1140	8	6.75	1235			
16	7.15	1370	16	7.15	1460			
24	7.5	1590	24	7.5	1730			
35	8.0	1900	35	8.0	2250			

Rotation—Counter-clockwise at commutator end.

Brush Spring Tension—35-53 ozs (new brushes).

Field Current—1.60-1.78 amperes at 6.0 volts.

Belt Adjustment—50 lbs. tension on generator or ½" thumb pressure belt deflection between pulleys.

REGULATOR: Auto-Lite Model VRP-4002C. Current-Voltage type.

Relay Closes—6.4-7.0 volts (set to 6.4-6.6 volts).

Relay Opens—4.1-4.8 volts with 4-6 amps. discharge

Voltage Setting—7.35 volts at 70°F.

Current Setting—34-36 amperes (marked "35").

Checking & Adjusting—See article in Electrical Equipment Section for data on this unit.

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LIGHTING: Headlamps—Sealed Beam type.

Adjustment—Aim upper beam straight ahead (hot spot center 3" below lamp center height at 25').

Lamp Bulbs—See Specification Table on Page 31.

THERMOSTATIC RELAY AND FUSES: Same as used on Packard Six. See preceding article for data.

ENGINE

ENGINE SPECIFICATIONS: 8 cylinder, "L" head type.

Bore—3¼". Stroke—4¼".

Displacement—282 cubic inches. Rated HP—33.8.

Developed Horsepower—125 at 3600 RPM.

Compression Ratio—6.85-1 cast-iron head.

All engine specifications are same as for Packard Six except as noted. See Packard Six article (preceding) for all data on Pistons, Pins, Rings, Connecting Rod and Crankshaft Bearings, Camshaft Setting and Valves.

VALVE TIMING

Valve Timing Check—With .0125" tappet clearance #1 intake valve opens 1° BTDC (piston .0004" BTDC) or 1 graduation before "DC" mark on vibration dampener aligned with pointer. Reset tappet clearance at .007" Intake, .010" Exhaust, Hot.

LUBRICATION & COOLING

LUBRICATION: Crankcase Capacity—5½ quarts.

Normal Oil Pressure—40 lbs. normal driving.

COOLING: Capacity—17 quarts.

Pressure Valve—In filler cap. Opens at 4½ lbs.

Thermostat—In outlet elbow on cylinder head. Opens at 145-150° (Std.), 160-165° (High Reading).

MECHANICAL

CLUTCH: Long Model 10CF-CI. Semi-centrifugal type.

Facings—Woven (U. S. Asbestos). Inside Diameter 6". Outside Diameter 10". Thickness .125".

Pedal Adjustment—1½-2" free travel. Adjust at clutch fork end of connector link.

OVERDRIVE: Governor controlled type.

Throttle Switch Setting—Adjust tappet screw on throttle lever to just contact switch plunger with throttle valve wide open (remove air cleaner on carburetor to observe throttle valve).

FRONT SUSPENSION: Independent parallelogram type with coil springs. See Specification Table Page 38.

BRAKES: Bendix Hydraulic "No Eccentric" type. Parking brake applies rear service brakes.

Clearance—.015" at both ends of secondary shoe with primary shoe forced out against drum.

Drum Diameter—12" centrifuse type.

Lining—Marshall 2201H-8 (primary), B-50 (secondary). Width 1¾". Thickness 3/16". Length per shoe: 11½" (primary), 13" (secondary).

PACKARD SUPER 8

HOOD LOCK: Same as for Packard Six.

MODEL IDENTIFICATION

SERIAL NUMBER: On left side of cowl (use Eng. No.).

ENGINE NUMBER: First number F500001. On upper left side of cyl. block between #3 and #4 cylinders.

TUNE-UP

COMPRESSION: Pressure—133 lbs. at 300 RPM.

VACUUM READING: Steady 18½" idling at 6 MPH.

FIRING ORDER: 1-6-2-5-8-3-7-4.

SPARK PLUGS: AC No. 104 or Champion Y4-A. 10mm. Gaps—.028" (.0255-.0305").

NOTE—Tighten spark plugs to 50 inch lbs. only.

IGNITION: See Coil, Condenser, and Distributor.

Breaker Gap—.017". Cam Angle—27° Closed.

Breaker Arm Spring Tension—17-20 ozs.

Rotation—Counter-clockwise viewed from above.

Automatic Advance—Starts 250 RPM, 6° at 700 RPM, Max. 11½° at 1800 RPM. Distributor degrees & RPM.

Vacuum Advance—Starts with 7" of vacuum, Max. 5½" with 16" of vacuum. Distributor degrees.

IGNITION TIMING: Std. Setting—4° BTDC.

Timing Mark—Vibration dampener at front of engine marked "#1 UP.DC" with fifteen 1° graduations before this point. Set ignition contacts to open at 4th graduation before "DC" mark.

Fuel Compensator—Set for slight ping accelerating with wide open throttle.

CARBURETION: See Carburetion.

Idle Setting—Set both idle adjusting screws 1 to 2 turns open. Adjust for smooth idle. Idle speed 6 MPH.

Float Level—5/32" from top of float to cover with valve seated (remove gasket and invert to check).

Accelerating Pump—Inner Hole (minimum) Normal, outer hole (max. stroke) if greater charge required.

Fuel Pump Pressure: 4¾ lbs. maximum.

MANIFOLD HEAT CONTROL: Thermostatic coil type. Make certain that valve operates freely and does not bind or stick.

VALVES: See Valve Timing.

Tappet Clearance—None in service (automatic hydraulic type tappet take-up).

STARTING: See Battery, Starter, Generator, and Regulator.

IGNITION

COIL: Auto-Lite No. CE-4659. Service Coil (less switch & cable) CE-3224US. On dash.

Ignition Current—2.4 amperes idling, 5 stopped.

CONDENSER: Auto-Lite Part No. IG-2671J.

Capacity—.20-.25 microfarad.

DISTRIBUTOR: Auto-Lite No. IGT-4203 (or IGT-4102). Automatic advance type with Vacuum Spark Control and Fuel Compensator adjustment.

See Tune-Up for distributor specifications.

IGNITION TIMING: See Tune-Up for settings.

CARBURETION

CARBURETOR: Carter Vacuumer Type WDO, Model 531S. 1¼" dual barrel downdraft type with Carter Climatic Control and Carter Car Starter. Casting No. 377.

See Tune-Up for carburetor adjustment instructions.

Metering Rod & Jet—Metering Jet No. 120-139S (.09055"). Standard Metering Rod No. 75-538. Checking Gauge No. T109-113 (2.280").

FAST IDLE: Setting—Adjust fast idle screw for .023-.028" throttle opening (Gauge T109-189) with choke valve tightly closed.

AUTOMATIC CHOKE: Setting—Coil housing centered to coincide with Index mark.

FUEL PUMP: AC type AH. Exchange No. 545. Diaphragm type.

Pressure—4¾ lbs. maximum.

AIR CLEANER: AC heavy duty oil bath type.

Servicing—Clean air cleaner and oil filler cap when changing crankcase oil. Re-fill with S.A.E. 50 (summer), S.A.E. 30 (winter) oil to indicated level (approx. 1 pint). Re-oil oil filler cap element.

ELECTRICAL

BATTERY: Auto-Lite PN-17ZR. 17 plate, 120 ampere hour capacity (20 hour rate).

Grounded Terminal—Positive (+) terminal.

Location—Under hood on left side of car.

STARTER: Auto-Lite MAX-4052. Arm. No. MAW-2069.

Drive—Solenoid pinion shift (SS-4205) through reduction gears.

Brush Spring Tension—42-53 ozs. (new brushes).

Rotation—Clockwise at commutator end.

Performance Data

Torque	RPM①	Volts	Amperes
0 ft. lbs.	2695	5.5	77
45.9 "	Lock	4.0	906

①—Pinion shaft RPM.

Vacuum Switch: Carter Car Starter No. 192-11U. Mounted on carburetor, operated by throttle shaft. Setting—Same as for 1942 type. See Carter Car Starter article in the Electrical Equipment Section.

GENERATOR: Auto-Lite Model GEA-4802A-1. Armature GDZ-2006F. Two brush (shunt) type with Current-Voltage regulation (no adjustment at generator).

Maximum Output—35 amperes, 8 volts, at 1700 generator RPM. (cold).

Cold Performance Data Hot

Amperes	Volts	R.P.M.	Amperes	Volts	R.P.M.
0	6.4	850	0	6.4	865
8	6.75	1050	8	6.75	1075
16	7.1	1250	16	7.1	1300
24	7.5	1440	24	7.5	1560
35	8.0	1700	35	8.0	1970

Rotation—Counter-clockwise at commutator end.

Brush Spring Tension—53 ozs. max. (new brushes).

Field Current—1.57-1.75 amperes at 6.0 volts.

Belt Adjustment—50 lbs. tension on generator or ½" thumb pressure belt deflection between pulleys.

REGULATOR: Auto-Lite Model VRP-4002C. All data same as listed for Packard Eight article (preceding).

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LIGHTING: Headlamps—Sealed Beam type.
Adjustment—Aim upper beam straight ahead (hot spot center 3" below lamp center height at 25').
Lamp Bulbs—See Specification Table on Page 31.

THERMOSTATIC RELAY AND FUSES: Same as used on Packard Six. See Packard Six article for data.

ENGINE

ENGINE SPECIFICATIONS: 8 cylinder, "L" head type.
Bore—3½". Stroke—4⅞".
Displacement—356 cubic inches. Rated HP—39.2.
Developed Horsepower—165 at 3600 RPM.
Compression Ratio—6.85-1 cast-iron head.

All engine specifications are same as for Packard Six except for Valves (below) and as noted. See Packard Six article (preceding) for all data on Pistons, Pins, Rings, Connecting Rod and Crankshaft Bearings, and Camshaft Setting.

VALVES: Head Diam. Seat Angle Stem Clearance
Intake 1.670" 30°002"
Exhaust 1 7/16" 45°004"

Valve Spring Pressure—60-66 lbs. at 1¼" (valve closed), 135-145 lbs. at 1 13/32" (valve open).

NOTE—Valve Lifters are Wilcox-Rich "Zero-Lash" type (hydraulic tappet take-up). Clearance between lifter and valve stem with hydraulic unit compressed must be .030-.070".

VALVE TIMING

Valve Timing Check—With hydraulic lifter dry (all oil drained out) and built up with feeler stock for zero tappet clearance, #1 exhaust valve closes 10° ATDC. (piston .0438" ATDC.).

LUBRICATION & COOLING

LUBRICATION: Crankcase Capacity—7 quarts.
Normal Oil Pressure—50 lbs. normal driving.

COOLING: Capacity—20 quarts.

Pressure Valve—In filler cap. Opens at 7 lbs.

Thermostat—In outlet elbow on cylinder head. Opens at 145-150° (Std.), 160-165° (High Reading).

MECHANICAL

CLUTCH: Long Model 11CF-CI. Semicentrifugal type.
Facings—Woven (U. S. Asbestos). Inside Diameter 6⅝". Outside Diameter 11". Thickness .125".

Pedal Adjustment—1¾-2¼" free travel. Adjust at clutch fork end of connector link.

OVERDRIVE: Governor controlled type.

Throttle Switch Setting—Adjust tappet screw on throttle lever to just contact switch plunger with throttle valve wide open (remove air cleaner on carburetor to observe throttle valve).

FRONT SUSPENSION: Independent parallelogram type with coil springs. See Specification Table Page 38.

BRAKES: Bendix Hydraulic "No Eccentric" type. Parking brake applies rear service brakes.

Clearance—.015" at both ends of secondary shoe with primary shoe forced out against drum.

Drum Diameter—12" centrifuse type.

Lining—Marshall 2201H-8 (primary), B-50 (secondary). Thickness 3/16". Width 2¼" (front wheel), 2" (rear).

Length per shoe: 11½" (primary), 13" (secondary).

LAMP BULB SPECIFICATION TABLE

Car Models	Head Lights	Parking	Beam Ind.	Instr. Panel	Ign. Lock	Clock	Stop-Tail①	Rear License	Dome & Reading
Buick	SB	1154②	51	55⑥		55	1154	63	82⑩
Cadillac	SB	1154②	51	55⑥	55	55	1154	63⑧	88
Chevrolet	SB	65	51	55⑥	51	55	1154⑦	63	82
Chrysler 6 & 8	SB	1158②	51	81③	51		1129-1158②	63	87
Crosley CC47	2320	55		55			1158⑥		
De Soto, Dodge	SB	63	51	81⑤	51		1129-63	63	87
Ford	SB	63	51	55⑨		55	1154	63②	63
Frazer	SB	1154②	51	55		51	1154	63	1129
Hudson	SB	55 ④	51	51②	55	55	1154	63	88
Jeep 1942-45	SB	63		63			1158②		
Kaiser	SB	1154②	51	55		51	1154	63	1129
Lincoln	SB	1154②	51	55		55	1129-1154②	63②	63
Mercury	SB	63③	51	55		55	1154	63②	63
Nash	SB	55	51	51			1129-63	63	81
Oldsmobile	SB	63	51	55⑤			1154	63⑧	82⑨
Packard	SB	1154②	51	55⑥		55	1154	63	82⑨
Plymouth	SB	63	51	81	51		1129-63	63	87
Pontiac	SB	63 ⑩	51	55		55	1154	63	82⑩
Studebaker	SB	55	51	55⑦	55	55	1158	63⑧	⑩
Willys Jeep CJ2A	SB	63		63			1158		
Willys 4-63	SB	55	51	51			1158		87

①—Single Entry (combination Stop & Tail light bulb at each rear fender). Double Entry (1st No.: Stop Light bulb at center of car at rear, on Trunk Lid. 2nd No.: Tail Light Bulbs or combination Tail and Rear Direction Signals, one at each rear fender).

②—Double filament bulb (3 cp. filament for Parking or Tail light, 21 cp. for Direction Signal).

③—Front Fender Lamp No. 63 (without Direction Signal). No. 1158 (with Direction Signal).

④—Glove Compartment Light No. 55.

⑤—Map Light, Speedometer Pointer Light, Aero-Drive & Direction Indicators No. 55. Glove Compartment No. 51.

⑥—On Sedan Del. & Coupe Pick-Up Box separate Stop Light No. 87 & Tail Light No. 63 are used.

⑦—Trunk Light No. 55.

⑧—Courtesy Lights No. 82.

⑨—Dome Light No. 55 on Convertible Models.

⑩—3cp. filament of 1154 bulb on cars with Direction Signals.

⑪—Speedometer Lamp No. 55 (52, 54), No. 51 (51, 53).

⑫—Dome Light No. 87 ('46), No. 88 ('47). Courtesy Light No. 64.

⑬—On Dodge, Instrument Lamps are No. 55.

⑭—Second Tail Lamp is No. 67 bulb.

⑮—1947 Models use: Map Light No. 88, Glove Compartment and Underhood Light No. 55.

⑯—Map Light No. 1129. Glove Compt. and Ashtray No. 51.

⑰—Instrument Lamps No. 51 on Commercial & Trucks.

⑱—Trunk (Luggage) Light No. 63 bulb.

⑲—Blackout Tail and Stop Lights No. 63 bulb.

SB—Sealed Beam type headlight unit.

DIRECTION SIGNALS

Buick—Front Signal use 21 cp. filament of Parking bulb. Rear Signal is a separate No. 1129 21 cp. bulb.

Dash Signals are No. 51 1 cp. bulbs.

Cadillac—Front Signal use 21 cp. filament of Parking bulb. Rear Signal (below each Tail Lamp) is a separate No. 1154 21-3 cp. bulb (3 cp. filament not used). Dash Signal is No. 51 1 cp. bulb.

Chrysler 6 & 8—Front Signal use 21 cp. filament of Parking bulb. Rear Signal use 21 cp. filament of Tail Lamp bulb. Dash Signals in speedometer face are No. 51.

De Soto, Dodge, Plymouth—Front Signal is a No. 1158 (De Soto), No. 1129 (Dodge, Plymouth) bulb. Rear Signal is a No. 1158 21-3 cp. bulb (replacing regular No. 63 Tail Light Bulb). Dash Signals in speedometer face (De Soto), at each side of High Beam Indicator (Dodge, Plymouth) are No. 51 bulbs.

Frazer-Kaiser—Front Signal is No. 1158 21-3 cp. bulb in each Front Fender Lamp. Rear Signal use separate No. 1129 21 cp. bulb at each Tail Lamp.

Dash Signals are No. 51 bulbs.

Hudson—Front Signal is a No. 1158 21-3 cp. bulb (replacing regular No. 63 Fender Lamp bulb). Rear Signal flashes right or left Stop Light. Dash Signal (No. 51 bulb) on upper left end of instrument panel.

Lincoln, Mercury—Front Signal use 21 cp. filament of Parking bulb. Rear Signal use 21 cp. filament of Tail Lamp bulb. Dash Signals No. 55 1½ cp. bulbs.

Packard—Front Signal use 21 cp. filament of Parking bulb. Rear Signal use separate 21 cp. filament single contact bulb at each Tail Light. Dash Signals in speedometer are No. 55 bulbs.

Pontiac—Front Signal is a No. 1154 21-3 cp. bulb (replacing regular No. 55 Parking bulb). Rear Signal flashes right or left Stop Light. Dash Signal (No. 51 bulb) in Control Switch.

Studebaker—Front Signal is a No. 1158 21-3 cp. bulb ('46 Champ., '47 Comm.), No. 1129 21 cp. bulb ('47 Champ.). Rear Signal is No. 1129 bulb. Dash Signal No. 55.

HOOD LOCK: Alligator type. Release instrument panel button and safety catch under hood nose.

MODEL IDENTIFICATION

SERIAL NUMBER: On right front door hinge post.
Starting Nos. Detroit Evansville Los Angeles
P15S Deluxe ... 15,154,001 ... 22,042,001 ... 26,000,001
P15C Spec. Del. ... 11,496,001 ... 20,165,001 ... 25,000,001
ENGINE NUMBER: On boss on left front side of cylinder block. First No. P15S- or P15C-1001.

TUNE-UP

COMPRESSION: Pressure—120 lbs. at cranking speed.
VACUUM READING: Steady 18-21" idling at 6 MPH.
FIRING ORDER: 1-5-3-6-2-4.

SPARK PLUGS: Auto-Lite Type A-5. 14 mm. Metric. Gaps—.025".

IGNITION: See Coil, Condenser, and Distributor.

Breaker Gap—.020". Cam Angle—38° Closed.

Breaker Arm Spring Tension—17-20 ozs.

Rotation—Clockwise viewed from above.

Automatic Advance: Starts 350 RPM. 3° at 400 RPM, 9° Max. at 1300 RPM. (U. S.—IGS-4207-1 distr.), 12° max. at 1750 RPM. (Canada: IGS-4208B1)

Vacuum Advance: Starts with 5" of HG., 9° max. with 14" of HG. (U. S.—IGS-4207-1), 7° max. with 15" of HG. (Canada—IGS-4208B-1).

IGNITION TIMING: Std. Setting—Top Dead Center. Timing Mark—"DC" mark on dampener aligned with pointer on chain case cover. Vary as follows:

Octane Selector—Set for slight ping when accelerating with wide open throttle between 10-30 MPH.

CARBURETION: See Carburetion.

Idle Setting: With engine warm, set throttle stop-screw for 6 MPH. idle speed. Set idle adjusting screw 1/2-1 1/4 turns open (for D6G1), 1/2-1 1/2 turns open (for Economy B6V1 or B6W1), adjust for smooth idle.

Float Level: Top of float (not seam) 5/64" (plus or minus 1/64") below top edge of bowl.

Accelerating Pump: Center Hole Normal Setting, Outer Hole (max.) Winter, Inner (min.) Summer.

Fuel Pump Pressure: 3-4 1/2 lbs.

MANIFOLD HEAT CONTROL: Thermostatic coil type. Install coil so approx. one full turn (335°) required to hook free end over stop stud for correct operation.

VALVES: See Valve Timing.

Tappet Clearance—.008" Intake, .010" Exh., Hot.

STARTING: See Battery, Starter, Generator, and Regulator.

IGNITION

COIL: Auto-Lite Model IG-4806. Mounted above distributor on ignition cable bracket.

Ignition Current—2 1/4 amperes idling, 5 1/2 stopped.

CONDENSER: Auto-Lite Part No. IG-3927A.

Capacity—.25-.28 microfarad.

DISTRIBUTOR: Auto-Lite Model IGS-4207-1 (U. S.), IGS-4208B-1 (Canada). Automatic advance type with Vacuum Spark Control and Octane Selector. See Tune-Up for distributor specifications.

IGNITION TIMING: See Tune-Up for settings.

CARBURETION

CARBURETOR: Carter B&B D6G1. 1 1/2 single barrel. Economy Carburetor—Carter (B&B) B6V1 or B6W1. See Tune-Up for carburetor adjustment directions.

Metering Jet—(D6G1) Carter 159-61S (254-258 cc.), (B6V1 and B6W1) Carter No. 159-70S (168-172 cc.).

FAST IDLE: Setting—No adjustment. On D6G1 only.

FUEL TANK FILTER: New self-cleaning type porous bronze filtering element in fuel tank. No servicing

required (drain tank yearly to remove water & dirt).

FUEL PUMP: Early Cars—AC Type "AT" #1523647. Exchange No. 505. Pressure—3-4 1/2 lbs.

Later Cars—New type mechanical pump. Can be identified by metal cover (in place of glass sediment bowl used on early cars). Pressure—3-4 1/2 lbs.

AIR CLEANER: AC heavy duty oil bath type.

Servicing—Clean and refill to indicated oil level at 1000 mile or 30 day intervals. Use S.A.E. 50 oil (above 32°F.), S.A.E. 20-W (below 32°F.).

ELECTRICAL

BATTERY: Auto-Lite PF-1-15 or Willard WT-1-15C. 15 plate, 95 ampere hr. capacity (20 hr. rate).

Grounded Terminal—Positive (+) to engine.

Location—Under hood on left side of car.

STARTER: Auto-Lite MZ-4133. Arm. MZ-2108 (U. S.).

Model MAW-4041. Arm. MAW-2030 (Canada)—See Dodge article for data on MAW-4041 (Canadian) Starter

Drive—Outboard Barrel type Bendix No. A-2089.

Rotation—Counter-clockwise at commutator end.

Brush Spring Tension—42-53 ozs. (new brushes).

Cranking Engine—150-175 amperes, 5.1 volts.

Performance Data

Torque	R.P.M.	Volts	Amperes
0 ft. lbs.	4300	5.5	70
4.95 "	750	4.5	300
11.8 "	Lock	4.0	560

GENERATOR: Auto-Lite GDZ-4801A. Arm. GDZ-2006F.

See Chrysler Six article for generator data.

REGULATOR: Auto-Lite Model VRP-4001A (First), VRP-4401A (Later). Voltage-Current type.

See Chrysler Six article for regulator data.

LIGHTING: Headlamps—Sealed Beam type.

Adjustment—Aim upper beam straight ahead (hot spot center 3" below lamp center height at 25').

Lamp Bulbs—See Specification Table on Page 31.

FUSES: Lighting—30 ampere. On lighting switch.

Clock—2 ampere. In connector in clock feed.

Radio—14 ampere. In wire fuse connector on radio.

ENGINE

ENGINE SPECIFICATIONS: 6 cylinder, "L" head type.

Bore—3 1/4". Stroke—4 3/8".

Displacement—217.8 cubic inches. Rated HP—25.35.

Developed Horsepower—95 at 3600 RPM.

Compression Ratio—6.6-1 cast-iron head standard.

PISTONS: 4 ring, lightweight, aluminum alloy, U-slot cam ground type.

Clearance—.0005-.001" 90° from pin bosses 3/4" from bottom of skirt. Should pass through bore of own weight with slight drag at room temp. (70°F.).

Removal—Pistons and rods removed from above.

Replacement Pistons—Std. size, .005", .020", .030", .040", .060" oversize. Semi-finished pistons for bores up to .023" oversize, & .025-.060" oversize.

Installation—U-slot away from valves.

PISTON RINGS: Width End Gap Side Clearance

Comp. (top) 3/32" .007-.015" .0025-.0040"

Comp. (#2) 3/32" .007-.015" .0020-.0035"

Oil Control 5/32" .007-.015" .0010-.0025"

Replacement Rings—Std. size and .005", .020", .030", .040", .050", and .060" oversize.

PISTON PIN: Floating type. Rod hole bronze bushed.

Clearance—Thumb press fit at 130°F. in piston, tight thumb push fit at 70°F. in rod bushing.

Replacement Pins—Furnished standard size and .0006", .003", and .008" oversize.

CONNECTING ROD BEARINGS: Replaceable precision type. No shims.

Clearance—.001-.0015". Sideplay—.0055-.0115".

Replacement Bearings—Furnished standard size and .001", .002", .010", .012" undersize.

Rod Installation—Wide portion of bearing to rear (#1, 3, 5), to front (#2, 4, 6). Oil hole to camshaft.

CRANKSHAFT BEARINGS: Replaceable precision type. No shims.

Clearance—.001-.0015". Endplay—.003-.007" (rear).

Replacement Bearings—Same as for rods above.

CAMSHAFT SETTING: Sprockets marked. Mesh chain with sprockets turned so that "O" marks are adjacent and in line with straightedge across centers.

VALVES: Head Diam. Seat Angle Stem Clearance

Intake 1 17/32" 45° .001-.003"

Exhaust 1 13/32" 45° .003-.005"

Valve Spring Pressure—40-45 lbs. at 1 3/4" (valve closed), 107-115 lbs. at 1 3/8" (valve open).

VALVE TIMING

Valve Timing Check—With .014" cold tappet clearance, #1 intake valve opens 12° BTDC. (piston .061" BTDC.) with 12th graduation before "DC" mark on vibration dampener in line with indicator on chain cover. Reset tappet clearance .008" Intake Hot.

LUBRICATION & COOLING

LUBRICATION: Crankcase Capacity—5 quarts refill.

Normal Oil Pressure—40-45 lbs. above 30 MPH.

NOTE—New Rotor type oil pump used.

Oil Filter—Replace every 8000 miles.

COOLING: Capacity—15 quarts.

Thermostat—In outlet elbow on cylinder head. Bypass type. Starts to open 157-162°F.

MECHANICAL

CLUTCH: Borg & Beck Model 9A7 (Std.), 11A6 (Taxi). Single plate, dry disc types.

Facings—Spiral woven, 2 used. I. D. 6" (9A7), 6 1/2" (11A6), O. D. 9 1/4" (9A7), 11" (11A6). Thickness 1/8".

Pedal Adjustment—Set pedal to just clear toeboard (stopscrew on lower end of pedal) and set for 1" free travel (adjust nut on connector link at fork).

NOTE—Do not disturb turnbuckle on pedal link.

Clutch Over-Center Spring: Requires servicing only if linkage disturbed or spring bracket on frame bent. Original setting can be obtained by using Miller Gauge C-705 as follows: Check spring bracket on frame and straighten if necessary, install gauge over linkage pivot pins with lower end engaging coil spring bracket on frame (turn pedal rod turnbuckle until gauge fits properly). Then re-set pedal position and free travel as directed above.

FRONT SUSPENSION: Independent parallelogram type with coil springs. See Specification Table Page 38.

BRAKES: Lockheed Hydraulic Two Cylinder type (Front), Double Anchor type (Rear). Hand lever applies independent shaft brake.

Clearance—.006" at each end of each shoe.

Drum Diameter—10".

Lining—Molded asbestos. Width 2". Thick. 13/64".

Length per wheel: Front 21", Rear 18 1/2".

Hand Brake: Independent type with brake drum mounted on driveshaft at rear of transmission.

Drum Diameter—6".

Lining—Width 2". Thickness 5/32". Length 16 11/16"

Adjustment—.015-.020" clearance around band. Adjust anchor screw for clearance at this point, adjust guide bolt adjusting nut for clearance at lower end of band, adjust large adjusting bolt nut (at lower end of bolt below spring) for clearance at upper end of band.

HOOD LOCK: Alligator hood. Release lock button on instrument panel and safety catch under hood nose.

MODEL IDENTIFICATION

SERIAL NUMBER: On plate on left side of dash under engine hood. First number and Model Designation are as follows:

	Six Cylinder	Eight Cylinder	
	Model Number①	Model Number①	
Torpedo ..	46-25 ... 6LA-1001	46-27 ... 8LA-1001	
Streamliner	46-26 ... 6LB-1001	46-28 ... 8LB-1001	
①—Prefix letter (ahead of number listed above) designates assembly plant as follows:			
Letter	Plant	Letter Plant	
A.....	Atlanta, Ga.	K.....	Kansas City, Kans.
C... ..	South Gate, Calif.	L.....	Linden, N. J.
F. Framingham, Mass.		P.....	Pontiac, Mich.
		W.....	Wilmington, Del.

ENGINE NUMBER: Same as Serial Number. Stamped on boss on left upper front corner of engine block.

TUNE-UP

COMPRESSION Pressure—160 lbs. (std. 6.5-1 hd.), 179 lbs. (HC 7.5-1 hd.) or approximately 118-120 lbs. at cranking speed (for standard head).

VACUUM READING: Steady 18-20" idling at 7-8 MPH.

FIRING ORDER: 1-5-3-6-2-4 (Six cylinder engine). 1-6-2-5-8-3-7-4 (Eight cylinder engine).

SPARK PLUGS: AC No. 45. 14 mm.. Metric type. Gaps—.025". Limits .023-.028".

IGNITION: See Coil, Condenser, and Distributor. Breaker Gap—.020" (6 Cyl.), .015" (8 Cyl.).

Cam Angle or Dwell—35° closed, 25° open (6 Cyl.), 31° closed, 14° open (8 Cyl.).

Breaker Spring Tension—17-21 ozs. (6), 19-23 (8).

Rotation—Counter-clockwise viewed from above.

Automatic Advance (6 Cyl.)—Starts at 400 RPM., 8° at 1050 RPM., 8½° at 1450 RPM., 14¼° at 2000 RPM. (Distr. degrees and RPM.).

Automatic Advance (8 Cyl.)—Starts at 400 RPM., 7° at 1100 RPM., 8½° at 1550 RPM., Max. 14° at 2100 RPM. (Distr. degrees and RPM.).

Vacuum Advance (6 Cyl.)—Starts with 7-9" of HG., Max. 7½-8½" (distr. degrees) with 16-18" of HG.

Vacuum Advance (8 Cyl.)—Starts with 7-9" of HG. Max. 9-10" (distr. degrees) with 16-21" of HG.

IGNITION TIMING: Std. Setting—6° BTDC.

Timing Mark—"IGN.ONE/" on flywheel (inspection hole in left front face of flywheel housing). Set ignition at first mark (6°). Second mark (2°) indicates allowable timing range of 4°.

Gaselector—Set for barely audible ping at 20-30 MPH on level road accelerating with wide open throttle.

CARBURETION (SIX): See Carburetion—Six Cyl.

Idle Setting—Set idle adjusting screw 1-1¼ turns open. Idle speed 450-475 RPM or 7-8 MPH.

Float Level—7/16" from machined projection on cover to top of soldered seam at free end (invert to check).

Accelerating Pump—Lower Hole Normal Setting. Upper hole, greater charge, Inner hole less charge.

Fuel Pump Pressure: 4¾ lbs. maximum.

CARBURETION (EIGHT): See Carburetion—8 Cyl.

Idle Setting—Set idle adjusting screws ¼-1¼ turns open. Idle speed 450-475 RPM or 7-8 MPH.

Float Level—5/16" from top of float to machined surface of cover (remove gasket, invert to check).

Accelerating Pump—Lower hole Normal setting, Upper hole (max. stroke) if greater charge required.

Fuel Pump Pressure: 4¾ lbs. maximum.

MANIFOLD HEAT CONTROL: Thermostatic coil type. Non-adjustable (fixed anchor pin). Counterweight should be securely clamped to shaft in approximately vertical position with valve closed (cold). NOTE—New stainless steel heat control valve shaft bushings used on 1946 engines.

VALVES: See Valve Timing.

Tappet Clearance—.011-.013" Hot, for all valves. .011" gauge "go," .013" "no go." NOTE—.013" exhaust clearance recommended for sustained high speeds.

STARTING: See Battery, Starter, Generator, and Regulator.

IGNITION

COIL: Delco-Remy No. 1115023 (Six cylinder cars), No. 1115129 (Eight Cylinder). On dash.

Ignition Current—2.5 amperes idling, 4.5 stopped.

CONDENSER: Delco-Remy Part No. 1889704.

Capacity—18-.25 microfarad.

DISTRIBUTOR: Delco-Remy Model 647-D (Six Cyl.), Model 1110804 (Eight Cyl.). Automatic advance types with Vacuum Spark Control and Gaselector.

See Tune-Up for distributor specifications.

IGNITION TIMING: See Tune-Up for settings.

CARBURETION

SIX CYLINDER MODELS

CARBURETOR: Carter Vacumeter Type WA-1, Model 537S. 1¼" single barrel downdraft type with Carter Climatic Control (automatic choke). Casting No. 388 on flange.

See Tune-Up for carburetor adjustment instructions.

Metering Rod & Jet—Metering Jet No. 120-133S (.0995"). Standard Metering Rod No. 75-528. Checking Gauge No. T109-102 (2.468").

THROTTLE CRACKER: Setting—Adjust the adjusting screw on accelerator cross-shaft lug at idler lever so that clearance between throttle stop screw and stop is .138" (use 9/64" drill rod as gauge) with starter pedal fully depressed and carburetor fast idle cam in hot or slow idle position.

FAST IDLE: Setting—¾" clearance between choke valve and air horn (gauge T109-85) with throttle stop screw against (not on) first step of fast idle cam. Adjust by bending fast idle link offset.

AUTOMATIC CHOKE: Setting—Set coil housing three notches Rich.

FUEL PUMP: AC type AH. Exchange No. 496. Diaphragm type. Type AJ comb. fuel & vacuum pump optional.

Pressure—4¾ lbs. maximum.

AIR CLEANER: AC oil-wetted type standard. Heavy duty Oil Bath type used together with larger oil filler cap filter and special crankcase ventilator outlet pipe filter is offered as optional equipment. Servicing—Should take place every 10,000 miles (or at Spring and Fall Tune-Up) or more often if required by local operating conditions. Wash oil-wetted type air cleaner and oil filter cap and re-oil, using engine oil. On heavy duty type, wash air cleaner, oil filler cap, and ventilator outlet pipe filter. Re-oil filler cap, and outlet pipe filter, fill air cleaner to indicated level with one pint SAE 50 engine oil (or 20W below freezing).

CARBURETION

EI HT CYLINDER MODELS

CARBURETOR: Carter Type WDO, Model 548S. 1¼" dual barrel downdraft type with Carter Climatic Control. Casting No. 306 on face of flange.

See Tune-Up for carburetor adjustment instructions.

Metering Rod & Jet—Metering Jet No. 120-103S (.089"). Standard Metering Rod No. 75-443. Checking Gauge No. T109-27 (2.359").

THROTTLE CRACKER: Setting—Same as for Six (above) except that clearance is .115".

FAST IDLE: Setting—Adjust fast idle screw for .026" throttle opening (use T109-189 gauge).

AUTOMATIC CHOKE: Setting—Set coil housing two notches Rich.

FUEL PUMP: AC type AJ. Exchange No. 539. Combination fuel-and-vacuum pump.

Pressure—4¾ lbs. maximum.

AIR CLEANER: Same as for Six cyl. (above).

ELECTRICAL

IMPORTANT SERVICE NOTE—Wire harness chafing—Harness having feed wire from starter may be chafing at starter motor lever, accelerator pedal lever, or accelerator cross shaft. Harness should have ¾-½" clearance at these points. Chafing can be caused by: 1)—Improper location of harness (should go down between starter and engine and then under starter); 2)—Clip on starter pedal bracket being bent out from dash (harness rubbing on accelerator cross shaft).

BATTERY: Delco 15E2-W. 15 plate, 100 ampere hour. Grounded Terminal—Negative (—) to engine.

Location—Under engine hood on left side.

STARTER: Delco-Remy Model 1107032 (6 Cylinder), Model 1107921 (8 Cyl.). Armature No. 1867897 (all).

NOTE—Later type 1946 starters equipped with oil-less type bushing on commutator end.

Drive—Overrunning clutch (manual pinion shift).

Rotation—Counter-clockwise at commutator end.

Brush Spring Tension—24-28 ozs.

Cranking Engine—Approximately 200 amperes (6 cyl.), 220-225 amperes (8 cyl.) at 5 volts.

Performance Data—Six Cylinder

Torque	ft. lbs.	R.P.M.	Volts	Amperes
0	5000	5.0	65
12	"	Lock	3.37	525

Performance Data—Eight Cylinder

Torque	ft. lbs.	R.P.M.	Volts	Amperes
0	6000	5.0	60
15	"	Lock	3.0	600

GENERATOR: Delco-Remy 1102665. Armature 1879002. Two brush (shunt) type with Current-Voltage regulation (no adjustment at generator).

Maximum Output—32-34 amperes, 7.2-7.4 volts, 1140 RPM (Hot) or 25 MPH.

Performance Data

	Amperes	Volts	R.P.M.
Cold	30	8.0	1750

Rotation—Counter-clockwise at commutator end.

Brush Spring Tension—25 ozs.

Field Current—1.67-1.82 amperes at 6.0 volts.

Belt Adjustment—1½" belt deflection at center.

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REGULATOR: Delco-Remy 1118242 or 1118201. Single Core type current-voltage regulator.

Relay Closes—6.2-6.7 volts hot. **Opens**—0-4 amperes.

Voltage Setting—7.2-7.4 volts hot (operating temp.).

Current Setting—32-34 amps. hot (operating temp.).

Checking & Adjusting—See article in *Electrical Equipment Section* on this unit.

LIGHTING: Headlamps—Sealed Beam type.

Adjustment—Aim upper beam straight ahead (hot spot center 3" below lamp center height at 25').

Lamp Bulbs—See *Specification Table* on Page 31.

THERMOSTATIC RELAY: On lighting switch. Remains closed with 30 amperes. Opens within 3 minutes with 42 amperes at 70°F. Not adjustable.

FUSES: Stop & Dome Light—9 ampere. On right side of lighting switch.

Instrument & Tail Light—9 ampere. In line fuse holder approx. 6" to left and above lighting switch.

Direction Signal—9 ampere. In line fuse holder from ignition switch to flasher.

ENGINE

SIX CYLINDER ENGINE SPECIFICATIONS: 6 cylinder, "L" head type.

Bore—3 9/16". **Stroke**—4".

Displacement—239.2 cubic inches. **Rated HP**—30.4.

Developed Horsepower—93½ at 3400 RPM.

Compression Ratio—6.5-1 Std., 7.5-1 Optl. iron hds.

EIGHT CYLINDER ENGINE SPECIFICATIONS: 8 cylinder, "L" head type.

Bore—3 1/4". **Stroke**—3 3/4".

Displacement—248.9 cubic inches. **Rated HP**—33.8.

Developed Horsepower—107½ at 3700 RPM.

Compression Ratio—6.5-1 Std., 7.5-1 Optl. iron hds.

PISTONS: 3 ring, chrome nickel iron, electroplated type. **Length** 3 19/32".

Weight—Stripped: 27.1 ozs. (6), 24.7 ozs. (8).

NOTE—Eight cyl. pistons now have 20 oil drain holes in oil ring groove (same as Six cyl.).

Clearance—Top land .0175-.0295" (6), .0165-.0285" (8). Skirt .002" or 10-20 lbs. pull on .0015"x½" feeler.

Removal—Pistons and rods removed from above.

Replacement Pistons—Standard size and .005", .010", .020", and .030" oversize.

PISTON RINGS:

	End Gap	Side		
	Width	6 Cyl.	8 Cyl.	Clearance
Compr.	3/32"	.007-.012"	.008-.015"	.0015-.003"
Oil Contr.	3/16"	.007-.012"	.006-.013"	.001-.0025"

NOTE—Install compression rings with mark TOP up.

Replacement Rings—Same sizes as listed for Pistons

PISTON PIN: Locked in piston boss by self-locking type lock screw. Pins are shot-peened.

Clearance—.0004-.0006" in rod bushing. 200-300 lbs. fit in piston (bosses coated with graphite grease).

Replacement Pins—.001" (red & brown paint mark on end of pin), .003" (red), .005" (blue) oversize.

CONNECTING ROD BEARINGS: Steel-backed, bab-

bitt-lined type. No shims.

Clearance—.0001-.0021". **Sideplay**—.007-.012".

Replacement Bearings—Standard and .001" undersize. **NOTE**—Align identification points on rod and cap when assembling cap on rod.

CRANKSHAFT BEARINGS: Steel-backed, babbit-lined type. No shims.

Clearance—.0003-.0023".

Endplay—.003-.008". Taken at #3 bearing (6 cyl.), at #4 bearing (8 cylinder engine).

6 CYLINDER NOTE—Rear main bearing cap oil seal groove now chamfered on each side and recessed at one end. When installing seal, seal must be packed in this recess (prevents packing from turning).

CAMSHAFT SETTING: Sprockets marked. Mesh chain with sprockets turned so that "0" marks are adjacent and in line with a straightedge across shaft centers.

VALVES: Head Diam. Seat Angle Stem Clearance

Intake 6.....1 19/32".....30°.....Free fit to .0006"①

Exhaust 6.....1 15/32".....45°.....Free fit to .0006"①

Intake 8.....1 15/32".....30°.....Free fit to .0006"①

Exhaust 8.....1 11/32".....45°.....Free fit to .0006"①

① Guides tapered (.0006" max. clearance at bottom).

NOTE—Exhaust valve guides now counterbored to depth of 31/32" (was ½"). If replacement guides installed check depth of counterbore (if necessary use Exhaust Valve Guide Counterbore cleaning tool J-2122 to secure this 31/32" dimension).

Valve Spring Pressure—59½ lbs. at 1 29/32" (valve closed), 101 lbs. at 1 19/32" (valve open).

VALVE TIMING

Valve Timing Check—With .015" tappet clearance #1 intake valve should open with #1 piston 5° or .0096" (6), .0089" (8) BTDC. with first straight line of flywheel mark "/IGN. ONE/" slightly past indicator in left front face of flywheel housing. Reset tappet clearance .011-.013" Hot, all valves.

LUBRICATION & COOLING

LUBRICATION: Crankcase Capacity—5 quarts (refill), 6 quarts (dry).

Normal Oil Pressure—35-40 lbs. at Normal driving speeds with WARM OIL.

Oil Cleaner—Precipitation type (same as 1942) located in oil pan. Requires no servicing except when oil pan removed cleaner should also be taken off and cleaned. **CAUTION**—Where car has been turned over, oil pan should be removed and oil cleaner and crankcase cleaned before engine is again operated.

COOLING: Capacity—18 qts. (Six), 19½ qts. (Eight); With Underseat Heater: 19¾ qts. (6), 21¼ qts. (8).

NOTE—Brass water distribution tube now used.

Pressure Valve—In filler cap. Opens at 3¾ lbs.

Thermostat—In outlet elbow on cylinder head. By-Pass type. Starts to open at 151°F.

MECHANICAL

CLUTCH: Inland. Diaphragm spring type with new sealed ball-bearing type release bearing.

Facings—Moulded, 2 used. Inside Diameter 6". Outside Diameter 9½". Thickness ¼". Same size plates used on both Six and Eight but are not interchangeable due to different torsional springs being used.

Driven Member Identification

	Spring Color	Facing Mark
Six cyl.	Orange & Dark Blue	'41-42 6 Cyl.
Eight cyl.	Brown & Blue	'41-42 8 Cyl.

Pedal Adjustment—7/8-1 1/8" free travel. Adjust connector link at clutch fork. **NOTE**—With clutch pedal against stop, pedal height (to lower face of pedal) should be 4¾" (Torpedo), 5 3/16" (Streamliner). Adjust stopscrew at lower end of pedal.

Clutch Release Bearing—New Sealed ball-bearing type (no lubrication required) piloted on tubular support assembled in clutch housing.

IMPORTANT SERVICE NOTE—Clutch Release Bearing Noise due to movement of bearing on support tube. New support tube (Part No. 509158) on which outside diameter increased to 1.366-1.371" (was 1.355-1.357") furnished for service replacement to correct bearing noise caused by excessive clearance between tube and inside diameter of bearing.

CAUTION—Noise may also be caused by excessive run-out between clutch spring (fingers) and bearing. Maximum run-out of fingers is .003" on 1 15/16" diameter.

REPLACEMENT NOTE—Always install new felt oil seal on transmission main drive gear whenever transmission removed. Install seal dry on drive gear and apply light coat of engine oil inside support tube.

FRONT SUSPENSION: Independent parallelogram type with coil springs. See *Specification Table* Page 38.

BRAKES: Bendix Hydraulic "With Eccentric" type. Hand lever applies rear wheel service brakes.

Clearance—.010" at heel and toe of each shoe.

Drum Diameter—11" pressed steel (alloy iron liner).

Lining—Moulded. Width per wheel: 2" (front), 1¾" (rear). Thickness 3/16". Length per shoe: 9 11/32" (primary), 11 31/32" (secondary).

IMPORTANT SERVICE NOTE—Brake Drums—Two different makes are used: 1) Kelsey-Hayes type can be identified by one-piece stamping and flange having a sharp edge; 2) Motor Wheel type consisting of two-stampings and rolled flange. Each pair of drums (on opposite sides of car) front & rear must be the same type.

Brake Drum Part Numbers

	Front Wheel	Rear
	Left	Right Wheel
Kelsey-Hayes	507371	507370
Motor Wheel	509221	509220

HOOD LOCK: Alligator hood. To raise hood, pull out hood lock button under left side of instrument panel, pull forward on safety catch under lower front edge of hood.

MODEL IDENTIFICATION

SERIAL NUMBER: First No. G-193001. Stamped on plate on left front door hinge pillar post.

ENGINE NUMBER: First No. 216501. Stamped on pad on upper left front corner of engine block.

TUNE-UP

COMPRESSION: Pressure—105 lbs. at cranking speed of 150 RPM for standard 6.5-1 Head.

VACUUM READING: Steady 17-18" idling at 8 MPH.

FIRING ORDER: 1-5-3-6-2-4.

SPARK PLUGS: Champion Type J-9. 14 mm. Metric. Gaps—.025". Limits .0225-.0275".

IGNITION: See Coil, Condenser, and Distributor.

Breaker Gap—.020". Cam Angle—35° (closed).

Breaker Arm Spring Tension—17-20 ozs.

Rotation—Counter-clockwise viewed from above.

Automatic Advance—Starts at 400 RPM. Maximum advance 7° at 1400 RPM (Distr. degrees & RPM).

Vacuum Advance—Starts with 4" vacuum. Maximum 9° distr. with 14¾" vacuum.

IGNITION TIMING: Std. Setting—2° BTDC.

Timing Mark—Flywheel mark "IGN/" at indicator in inspection hole in left rear motor support.

NOTE—Insert .020" feeler between modifier control arm and clamp arm before tightening clamp-screw (to prevent binding).

Octane Selector Setting—Set to just eliminate ping when engine hot and pulling hard (advance spark toward "A" end of scale until engine pings, then retard spark toward "R" end of scale until ping disappears).

CARBURETION: See Carburetion.

Idle Setting—Idle adjusting screw ½-1½ turn open (turn screw out for richer mixture). Idle speed 8 MPH.

Float Level—¼" from top of projection on float bowl cover to top of soldered seam on free end of float with valve seated (invert to check).

Accelerating Pump—No adjustment.

Fuel Pump Pressure: 3½ lbs. max.

MANIFOLD HEAT CONTROL: Thermostatic coil type. See that valve operates freely (stainless steel bushings used in manifold to reduce sticking).

VALVES: See Valve Timing.

Tappet Clearance—.016" All Valves—Cold.

STARTING: See Battery, Starter, Generator and Regulator.

IGNITION

COIL: Auto-Lite CE-4646 or CE-4664. Service Coil CE-3224WS. Mounted on engine side of dash.

Ignition Current—½-1½ amperes idling, 4-5 stop-ped.

CONDENSER: Auto-Lite Part No. IG-2671. Capacity—20-25 microfarad.

DISTRIBUTOR: Auto-Lite Model IGC-4801. Full automatic advance type with separate No. VC-4011 vacuum spark control unit and Octane Selector adjustment.

See Tune-Up for distributor specifications.

CARBURETION

All carburetion units, specifications, and service data are same as for 1947 Champion Model 6G. See 1947 Champion Model 6G article (following) for data.

ELECTRICAL

BATTERY: Willard, Type SW-1-90 (Orig. Equip.), SW-1-92 (Replacement). 6 volt, 15 plate, 92 Ampere Hour capacity (20 hour rate).

Grounded Terminal—Positive (+) terminal.

Location—In engine compartment on left side.

STARTER: Auto-Lite MZ-4090. Armature MZ-2130.

Drive—Barrel type Bendix No. A-2033.

Rotation—Counter-clockwise at commutator end.

Brush Spring Tension—42-53 ozs. (new brushes).

Cranking Engine—150 amperes, 5.2 volts, 150 RPM.

Performance Data

Torque	RPM	Volts	Amperes
0 ft. lbs.	4300	5.5	70
2.55 "	1325	5.0	200
7.65 "	220	4.0	400
11.8 "	Lock	4.0	560

GENERATOR & REGULATOR: Same as used on 1947 Champion Model 6G. See 1947 Champion Model 6G article (following) for data.

LIGHTING: Headlamps—Corcoran-Brown Sealed Beam.

Adjustment—Aim upper beam straight ahead (hot spot center 3" below lamp center height at 25').

Lamp Bulbs—See Specification Table on Page 31.

FUSES: Lighting—20 ampere. Three or four fuses on fuse block on back of instrument panel on left side.

Protect lighting & accessory circuits thus:

- #1—Stop Light and Clock (power).
- #2—Headlamps, Tail & Instrument Lamps, Clock (lamps), Parking & Rear License Lamps.
- #3—Dome & Courtesy Lamps, Rear Cigar Lighter.
- #4—Accessories (Climatizer, Defroster, Direction Signal, etc.—controlled by Ignition Switch).

Transmission Overdrive Control—20 ampere. On control relay.

Clock—2 ampere. In connector in feed wire.

ENGINE

ENGINE SPECIFICATIONS: Six cylinder, "L" head. Bore—3.000". Stroke—4.000".

Displacement—169.6 cu.ins. Rated H.P.—21.6.

Developed Horsepower—80 at 4000 RPM.

Compression Ratio—6.5-1 Std. 7.0-1 Optl. Heads are Cast Iron.

All engine specifications are same as 1947 Champion 6G except for Connecting Rod Bearings (below) and items noted in Champion 6G article. See 1947 Studebaker Champion 6G article for all engine data except:

CONNECTING ROD BEARINGS: Spun babbitt-lined type. No shims. Adjust by installing new or exchange rods.

Clearance—.0005-.002". Sideplay—.005-.009".

Replacement Bearings—New rods furnished on exchange basis in Std. size and .010", .020" Undersize.

Installing Rods—Lower bearing offset. Install rods with narrow portion of bearing toward front of engine (#1, 3, 5), toward rear (#2, 4, 6). Numbers on rods and bearing caps must be together and installed in same numbered cylinder with No. and oil hole in lower end of rod toward camshaft side of engine.

VALVE TIMING

Valve Timing Check—With .020" tappet clearance, #1 intake valve should open with piston 15° or .084" before top dead center with flywheel mark "IN-OP. 1-6/" at pointer in inspection hole in left rear motor support. Reset tappet clearance at .016" Cold.

LUBRICATION & COOLING

LUBRICATION: Crankcase Capacity—5 qts.

Normal Oil Pressure—40 lbs. at 25-30 MPH.

Oil Filter—Fram type Optl. Renew filter cartridge at 5000 mile intervals or more often if required by operating conditions.

COOLING: Capacity—10½ qts.

Thermostat—In cylinder head outlet (no by-pass). Starts to open at 151-155°F.

MECHANICAL

CLUTCH: Borg & Beck Model 8A7. Single plate, dry disc type.

Pedal Adjustment—Free travel 1" minimum. Adjust by loosening locknuts on link connecting pedal and throw-out shaft lever, turn adjusting sleeve.

Hill-Holder (NoRol) Note—Check setting whenever clutch pedal adjusted, set to release just as clutch engages.

Facings—Moulded Asbestos. I.D. 5⅜", O.D. 8", Thickness ⅛".

OVERDRIVE: Warner Type R7C (with Type T-84G Transmission). Electrical "kick-down" type.

Throttle Switch Setting—Adjust so that shoe on accelerator linkage just contacts switch plunger with throttle valve wide open (switch is operated by additional accelerator pedal travel past the wide open throttle point).

FRONT SUSPENSION: Planar type independent suspension with transverse spring. See Specification Table on Page 38.

BRAKES: Lockheed Hydraulic, Single Anchor type. Hand lever applies rear wheel service brakes.

Clearance—.010" toe (top), .005" heel, for each shoe.

Drum Diameter—9". Budd composite type.

Lining—Moulded type. Width 1¾", Thickness 3/16", Length per wheel 18" (10 13/16" front shoe, 7 3/16" rear shoe).

HOOD LOCK: Hood is Alligator type. To raise hood, pull out hood lock button (2nd from left on instrument panel), pull forward on safety catch under front edge of hood.

OIL PAN REMOVAL: Manufacturer recommends that engine be removed from chassis and mounted on stand for pan removal and service work.

MODEL IDENTIFICATION

SERIAL NUMBER: First No. G-212501 (South Bend), G-824001 (Los Angeles). Stamped on plate on left front door lock pillar post.

ENGINE NUMBER: First No. 236001. Stamped on pad on upper front left corner of engine block.

TUNE-UP

COMPRESSION: Pressure—105 lbs. at cranking speed of 150 RPM for Std. 6.5-1 Head.

VACUUM READING: Steady 17-18" idling at 8 MPH.

FIRING ORDER: 1-5-3-6-2-4.

SPARK PLUGS: Champion Type J-7 or J-9. 14 mm. metric type. Gaps—.025". Limits .0225-.0275".

IGNITION: See Coil, Condenser, and Distributor.

Breaker Gap—.020". Cam Angle 35° (closed).

Breaker Arm Spring Tension—17-20 ozs.

Rotation—Counter-clockwise viewed from above.

Automatic Advance—Starts at 400 RPM. Maximum advance 7° at 1400 RPM (Distr. degrees & RPM).

Vacuum Advance—Starts with 4" vacuum. Maximum 9° distr. with 14 3/4" vacuum.

IGNITION TIMING: Std. Setting—2° BTDC.

Timing Mark—Vibration Dipper mark "IGN/" aligned with pointer on left side of engine. NOTE—Insert .020" feeler between modifier control arm and clamp arm before tightening clampscrew.

Octane Selector Setting—Set to just eliminate ping when engine hot and pulling hard.

CARBURETION: See Carburetion.

Idle Setting—Idle adjusting screw 1/2-1 1/2 turn open (turn screw out for richer mixture) and set for smooth idling. Idle speed 8 MPH.

Float Level—1/4" from top of projection on float bowl cover to top of soldered seam on free end of float with valve seated (invert to check).

Accelerating Pump—No adjustment.

Fuel Pump Pressure: 3 1/2 lbs. max.

MANIFOLD HEAT CONTROL: Automatic thermostatic type. See that valve operates freely.

VALVES: See Valve Timing.

Tappet Clearance—.016" All Valves, Cold.

STARTING: See Battery, Starter, Generator and Regulator.

IGNITION

COIL: Auto-Lite Model CE-4032. Mounted on engine above distributor (under spark plug cable bracket).

Ignition Current—1/2-1 1/2 amps. idling, 4-5 stopped.

CONDENSER: Auto-Lite Part No. IG-2671.

Capacity—.20-.25 microfarad.

DISTRIBUTOR: Auto-Lite Model IGC-4805. Full automatic advance type with separate No. VC-4011 vacuum spark control unit and Octane Selector.

See Tune-Up for distributor specifications.

IGNITION TIMING: See Tune-Up for settings.

CARBURETION

CARBURETOR: Carter WE, Model 532-S. 1 1/4" Single Barrel, downdraft type with Climatic Control. See Tune-Up for carburetor adjustment directions.

Std. Metering Rod—No. 75-484. Checking Gauge No. T109-102 (2.468"). Metering Jet—No. 120-67S (.098").

FAST IDLE: Setting—.054" throttle opening with choke valve closed. To check, open throttle wide to make certain fast idle cam drops into position (thermostatic coil housing, gasket and baffle plate must be removed for visual inspection of fast idle cam), then with choke valve closed, measure clearance between edge of throttle valve and wall on side opposite idle port. To adjust, loosen locknuts and turn adjusting sleeve on connector link.

AUTOMATIC CHOKE: Setting—Centered (at index).
AIR CLEANER: AC. No. 1529210 Oil-wetted Type Std., No. 1529211 Oil-bath Type Optl.

● **Servicing (Oil-wetted type)**—Clean and re-oil filter element at 1000 mile intervals or as required by operating conditions. Filter Element No. 2.

Servicing (Oil-bath type)—Clean filter element and oil reservoir, fill reservoir to indicated level mark with SAE No. 40 or 50 engine oil at intervals as required by operating conditions.

FUEL PUMP: AC Type AE. Diaphragm type. Pump Exchange No. 527. Pressure—3 1/2 lbs. max.

ELECTRICAL

BATTERY: Willard Type HW-1-100. 6 volt, 15 plate, 100 Ampere Hour capacity (20 hour rate).

Grounded Terminal—Positive (+) terminal.

Location—In engine compartment on left side.

STARTER: Auto-Lite MZ-4136. Armature MZ-2211. Drive—Barrel type Bendix No. A-1792.

Rotation—Counter-clockwise at commutator end.

Brush Spring Tension—42-53 ozs. (new brushes).

Cranking Engine—150 amperes, 5.2 volts, 150 RPM.

Performance Data

Torque	RPM.	Volts	Amperes
0 ft. lbs.	4300	5.5	70
2.55 "	1325	5.0	200
7.65 "	220	4.0	400
11.8 "	Lock	4.0	560

GENERATOR: Auto-Lite GDZ-4804-A. Arm. GDZ-2006F. Two brush (shunt) type with voltage and current regulation. Ventilated.

Maximum Charging Rate—35 amperes, 7.35 volts, 1900 generator RPM or approximately 18.3 MPH (5G), 18.1 MPH. (6G), 18.6 MPH. (14A).

Cold			Performance Data			Hot		
Amperes	Volts	RPM.	Amperes	Volts	RPM.	Amperes	Volts	RPM.
0	6.4	925	0	6.4	1000			
8	6.75	1140	8	6.75	1235			
16	7.15	1370	16	7.15	1460			
24	7.5	1590	24	7.5	1730			
35	8.0	1900	35	8.0	2250			

Rotation—Counter-clockwise at commutator end.

Brush Spring Tension—35-53 ozs. (new brushes).

Field Current—1.60-1.78 amperes at 6.0 volts.

Belt Adjustment—3/8-1/2" belt deflection midway between generator and fan pulleys.

REGULATOR: Auto-Lite VRP-4004F. Voltage-Current type.

Relay Closes—6.4-7.0 volts (setting 6.4-6.6 volts).

Relay Opens—4.1-4.8 volts (with 4-6 ampere disch.).

Voltage Setting—7.2-7.5 volts at 70°F.

Current Setting—34-36 amperes.

Checking & Adjusting—See article in Electrical Equipment Section on this unit.

LIGHTING: Headlamps—Corcoran-Brown Sealed Beam.

Adjustment—Aim upper beam straight ahead (hot spot center 3" below lamp center height at 25').

Lamp Bulbs—See Specification Table on Page 31.

LIGHTING CIRCUIT BREAKER: One 30-ampere type on back of lighting switch (protects headlamps, parking, tail, and instrument lamps), one 15-ampere type behind instrument panel on left side (protects body and stop lamps). These units protect lighting circuits by vibrating to limit current flow.

ACCESSORY CIRCUIT BREAKER: One 15-ampere type used on cars with Climatizer and Defroster.

FUSES: Clock—3 ampere. In clock lead.

Direction Signal—14 ampere. In Flasher lead.

Overdrive—20 ampere. On Overdrive Relay.

Glove Comp. Light—5 ampere. In lamp lead.

Under Hood Light—5 ampere. In lamp lead.

ENGINE

ENGINE SPECIFICATIONS: Six cylinder, "L" head.

Bore—3.000". Stroke—4.000".

Displacement—169.6 cu.ins. Rated H.P.—21.6.

Developed Horsepower—80 at 4000 RPM.

Compression Ratio—6.5-1 Std., 7.0-1 Optl. Heads are Cast Iron.

PISTONS: Three-ring, Lynite aluminum alloy, cam ground, "T" slot, tin-plated type. Length—2 29/32". Weight—8.48 ozs. (stripped).

Removal—Pistons and rods removed from above.

Clearance—Fit new pistons with .002" feeler, 1" wide, between piston and cylinder wall on camshaft side (piston pin parallel to camshaft, slot away from camshaft). Pull required to withdraw feeler should be 11-16 lbs.

Installing Pistons—T-slot away from camshaft.

Replacement Pistons—Furnished Standard and .002", .004", .010", .015", .020", .030" Oversize.

PISTON RINGS: Width End Gap Side Clearance
Compr. (#1) 3/32"007-.017"0015-.002"
Compr. (#2) 1/8"007-.017"0015-.002"
Oil Contr. (#3) 5/32"007-.017"0015-.002"

Replacement Rings—Std. and .010", .020", .030" O.S.

PISTON PIN: Locked in rod (taper lock pin engages notch in piston pin). NOTE—Lock pin retained by nut on one end, reverse nut (install on opposite end of pin) to withdraw lock pin.

Clearance—.0001-.0003" in piston or light finger push fit with piston at room temperature (70°F).

CONNECTING ROD BEARINGS: Interchangeable, steel-backed, micro-babbitt lined type. Install bearings with tongues engaging grooves in rod and cap. Clearance—.0005-.002". Side play—.005-.009".

Replacement Bearings—Furnished Std. size and .010", .020" Undersize.

Installing Rods—Lower bearing offset. Install rods with narrow portion of bearing toward front of engine (#1, 3, 5), toward rear (#2, 4, 6). Numbers on rods and bearing caps together and installed in same numbered cylinders with No. and oil hole in lower end of rod toward camshaft side of engine.

CRANKSHAFT BEARINGS: Removable, steel-backed, babbitt lined type. No shims.

Clearance—.0005-.0025". Endplay .003-.006" (front).

Replacement Bearings—Furnished Std. size and .010", .020", .030" Undersize.

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CAMSHAFT SETTING: Mesh marked tooth of camshaft gear with marked teeth of crankshaft gear.

VALVES: Head Diam. Seat Angle Stem Clearance

Intake	1 11/32"	45°	0015-.0035"
Exhaust	1 9/32"	45°	0015-.0035"

Valve Spring Pressure—52-56 lbs. at 1 21/32" (closed), 90-94 lbs. at 1 11/32" (open). Free length 2 3/32".

VALVE TIMING

Valve Timing Check—With .020" tappet clearance, #1 intake valve opens with piston 15° or .085" before top dead center with vibration dampener mark "IN-OP.1-6/" at pointer on timing gear cover. Reset tappet clearance .016".

LUBRICATION & COOLING

LUBRICATION: Crankcase Capacity—5 qts.
Oil Pan Removal—Remove engine from chassis.
Normal Oil Pressure—40 lbs. at 25-30 MPH.
Oil Filter—Fram type Optl. Replace filter cartridge at 5000 mile intervals or more often if required.

COOLING: Capacity—10 qts. (11 with Climatizer).
Thermostat—In cylinder head outlet (no by-pass). Starts to open at 151-155°F.

MECHANICAL

CLUTCH: Borg & Beck Model 8A7 (Champion), 9A6 (Commander). Single plate, dry disc type.
Pedal Adjustment—Free travel 1" minimum. To adjust, unhook pull-back spring on outside of frame side rail, remove clevis pin at pedal end of operating shaft connector rod, adjust clevis on end of rod.
Facings—Molded Metallic. I.D. 5 5/8" (8A7), 6" (9A6), O.D. 8" (8A7), 9 1/4" (9A6), Thickness 1/8" (all).
NOTE—Special driven member used on Champion cars with Overdrive. Driven members can be identified by color of damper springs on hub—4 Lavender springs (without Overdrive), 2 Lavender & 2 Black springs (with Overdrive).

OVERDRIVE: Warner. New governor controlled type (no centrifugal pawls) with electrical solenoid operation and throttle controlled "kick-down."
Throttle Switch Setting—Adjust throttle kick-down switch so that throttle linkage contacts switch plunger with carburetor throttle in wide-open position (over-travel of linkage operates switch).

FRONT SUSPENSION: Planar type independent suspension with transverse spring. NOTE—Suspension now has new lower control arms (spring ends rest on rubber pads on lower control arm and are not used to position steering knuckle).
See Front Suspension Specification Table on Page 38.

BRAKES: Lockheed (Wagner Electric) Hydraulic, Self-centering, self-adjusting type. Brake is new design with automatic spring-loaded adjusting wedge controlled by contact plug projecting through hole in brake lining of forward shoe (plug contacts drum when brakes applied).

Clearance—Adjustment necessary only when new linings installed. Adjust eccentric on each shoe so that wheel turns freely without drag. NOTE—Contact plug must not project more than .005" beyond face of new lining.

Drum Diameter—9" (Champion), 11" (Commander).
Lining—Moulded type (all shoes). Width 2", Thickness 3/16". Length per wheel 18.5" (Champion), 22 1/4" (Commander).

1947 COMMANDER

HOOD LOCK: Hood Alligator type. Hood lock is same type used on Champion.

MODEL IDENTIFICATION

SERIAL NUMBER: First No. 4232501 (South Bend), 4818501 (Los Angeles). Stamped on plate on left front door lock pillar post.

ENGINE NUMBER: First No. H-182001. Stamped on pad on upper front left corner of engine block.

TUNE-UP

COMPRESSION: Pressure—105 lbs. at cranking speed of 150 RPM. for Std. 6.5-1 Head.

VACUUM READING: Steady 18-20" idling at 8 MPH.

FIRING ORDER: 1-5-3-6-2-4.

SPARK PLUGS: Champion Type J-7 or J-9. 14 mm. Metric type. Gaps—.025" (.0225-.0275").

IGNITION: See Coil, Condenser, and Distributor.

Breaker Gap—.020". Cam Angle—35° (closed).

Breaker Arm Spring Tension—17-20 ozs.

Rotation—Counter-clockwise viewed from above.

Automatic Advance—Starts at 400 RPM, Maximum advance 10° at 1400 RPM. (Distr. degrees & RPM).

Vacuum Advance—Starts with 3" vacuum. Maximum advance 6° (distr.) with 12" vacuum.

IGNITION TIMING: Std. Setting—2° BTDC.

Timing Mark—Vibration Dampener mark "IGN/" aligned with pointer on gear case cover. NOTE—Insert .020" feeler between modifier control arm and clamp arm before tightening clampscrew (to prevent binding).

Octane Selector Setting—Set to just eliminate ping when engine hot and pulling hard.

CARBURETION: See Carburetion.

Idle Setting—Adjust idle adjusting screw for smooth idling with warm engine (turn screw out for richer mixture). Idle speed 8 MPH.

Float Level—Fuel level 5/8" below top edge of float bowl with engine idling.

Accelerating Pump—Center hole (med. stroke) Normal all-season setting. Inner hole (min.)—Summer, Outer hole (max.)—Winter used for temperature extremes.

Fuel Pump Pressure: 3 1/2 lbs. max.

MANIFOLD HEAT CONTROL: Automatic thermostatic type. See that valve operates freely (stainless steel bushings used in manifold to reduce sticking).

VALVES: See Valve Timing.

Tappet Clearance—.016" All Valves—Cold.

STARTING: See Battery, Starter, Generator, and Regulator.

IGNITION

COIL: Auto-Lite Model CE-4032. Mounted on engine above distributor (under spark plug cable bracket).
Ignition Current—1/2-1 1/2 amps. idling, 4-5 stopped.

CONDENSER: Auto-Lite Part No. IG-2671.

Capacity—.20-.25 microfarad

DISTRIBUTOR: Auto-Lite Model IGC-4802. Full automatic advance with separate No. VC-4004 vacuum spark control unit and Octane Selector adjustment.

See Tune-Up for distributor specifications.

IGNITION TIMING: See Tune-Up for settings.

CARBURETION

CARBURETOR: Stromberg Model BXOV-26. 1 1/4" single Barrel, downdraft type with Automatic Choke. See Tune-Up for carburetor adjustment directions.
Metering Jet—Std. Main Metering Jet No. P-19442 (.057").

FAST IDLE: Setting—To check, hold throttle stop-screw against lowest step of fast idle cam, move choke valve toward closed position as far as possible, check choke valve opening with 11/32" drill rod (Tool T-25085). Adjust by bending connector rod at offset near upper end.

AUTOMATIC CHOKE: Setting—Mark "R" on thermostat cover scale in line with projection on housing. If engine tends to overchoke or load up, shift setting to mark "M". Use mark "H" setting only with highly volatile fuels.

AIR CLEANER: AC. Oil-wetted Type Std., Heavy Duty Oil-bath Type Optl.

Servicing (Oil-wetted type)—Clean and re-oil filter element at 1000 mile intervals or as required by operating conditions.

Servicing (Oil-bath type)—Clean filter element and oil reservoir, fill reservoir to indicated level mark with SAE No. 40 or 50 engine oil at intervals as required by operating conditions.

FUEL PUMP: AC Type AE. Diaphragm type. Pump Exchange No. 527. Pressure—3 1/2 lbs. max.

ELECTRICAL

BATTERY: Willard Type HW-1-100. 6 volt, 15 plate, 100 Ampere Hour Capacity (20 hour rate).

Grounded Terminal—Positive (+) terminal.

Location—In engine compartment on left side.

STARTER: Auto-Lite MAW-4020, MAW-4020A, MCH-4001.

Armature—Auto-Lite No. MAW-2091 (MAW-4020).
Drive—Barrel type Bendix No. A-1729.

Brush Spring Tension—42-53 ozs. (new brushes).

Rotation—Counter-clockwise at commutator end.
Cranking Engine—175 amperes, 5-5.5 volts, 150 RPM.

Performance Data (MAW-4020, 20A)

Torque	ft. lbs.	RPM.	Volts	Amperes
0	4900	5.5	65	
5.45	820	4.5	300	
11.55	110	3.5	500	
18.0	Lock	4.0	670	

GENERATOR: Auto-Lite GDZ-4805-A. Arm. GDZ-2006F. Two brush (shunt) type, current-voltage regulation.

Maximum Output—35 amperes, 8.0 volts, 1900 RPM. or approximately 18.6 MPH.

Cold		Performance Data		Hot	
Amperes	Volts	R.P.M.	Amperes	Volts	R.P.M.
0	6.4	925	0	6.4	1000
8	6.75	1140	8	6.75	1235
16	7.15	1370	16	7.15	1460
24	7.5	1590	24	7.5	1730
35	8.0	1900	35	8.0	2250

Rotation—Counter-clockwise at commutator end.
Brush Spring Tension—35-53 ozs. (new brushes).

Field Current—1.60-1.78 amperes at 6 volts.

Belt Adjustment—3/8-1/2" belt deflection midway between generator and fan pulleys.

C NTINUED ON NEXT PAGE

CONTINUED FROM PRECEDING PAGE

REGULATOR: Auto-Lite Model VRP-4004F, Voltage-Current Type.

Relay Closes—6.4-7.0 volts (set to 6.4-6.6 volts).

Relay Opens—4.1-4.8 volts with 4-6 amps. discharge.

Voltage Setting—7.35 volts at 70°F.

Current Setting—34-36 amperes (marked "35").

Checking & Adjusting—See article in *Electrical Equipment Section* for data on this unit.

See Studebaker 1947 Champion article (preceding) for other electrical data.

ENGINE

ENGINE SPECIFICATIONS: Six cylinder, "L" Head.

Bore—3 5/16". **Stroke**—4 3/8".

Displacement—226.2 cu.ins. **Rated H.P.** 26.35.

Developed Horsepower—94 at 3600 RPM.

Compression Ratio—6.5-1 Std., 7.0-1 Optl. Heads are Cast Iron.

PISTONS: Three-ring, Lynite aluminum alloy, cam ground, "T" slot, tin-plated type. **Length** 3 3/4".

Weight—14.4 ozs. (stripped).

Removal—Pistons and rods removed from above.

Clearance—Fit new pistons with .002" feeler, 1" wide, between piston and cylinder wall on camshaft side (piston pin parallel to camshaft, slot away from camshaft). Pull required to withdraw feeler should be 10-15 lbs.

Installing Pistons—T-slot away from camshaft.

Replacement Pistons—Furnished Std. size and .002", .004", .010", .015", .020", .030" Oversize.

PISTON RINGS: **Width** **End Gap** **Side Clearance**
Compr. (#1, 2) 3/32" .009-.014" .0015-.002"
Oil Cont. (#3) 3/16" .009-.014" .0015-.002"

Replacement Rings—Furnished Std. size and .010", .020", .030" Oversize.

PISTON PIN: Locked in rod (new taper lock pin engages notch in piston pin, lock pin retained by nut on one end). **NOTE**—To remove lock pin, reverse retaining nut (install nut on opposite end of pin and turn nut up to withdraw pin).

Clearance—.0001-.0003" in piston or light finger push fit with piston at room temperature (70°F).

CONNECTING ROD BEARINGS: Interchangeable, steel-backed, micro-babbitt lined type. Install bearings with tongues engaging grooves in rod and bearing cap.

Clearance—.0005-.002". **Sideplay**—.005-.009".

Replacement Bearings—Furnished Std. size and .010", .020" Undersize.

Installing Rods—Lower bearings offset. Install rods with narrow portion of bearing toward front of engine (#1, 3, 5), toward rear (#2, 4, 6). Number on rods and bearing caps must be together and installed in same numbered cylinders with No. and oil hole in lower end of rod toward camshaft side of engine.

CRANKSHAFT BEARINGS: Removable, steel-backed, babbitt lined type. No shims.

Clearance—.0005-.0025". **Endplay** .003-.006" (front).

Replacement Bearings—Furnished Std. size and .010", .020", .030" Undersize.

CAMSHAFT SETTING: Mesh marked tooth of camshaft gear between two marked teeth of crankshaft gear.

VALVES: **Head Diam.** **Seat Angle** **Stem Clearance**

Intake 1 15/32" 45°0015-.0035"

Exhaust 1 9/32" 45°0015-.0035"

Valve Spring Pressure—54-60 lbs. at 2 3/32" (closed), 125-135 lbs. at 1 3/4" (open). **Free length** 2 1/2".

VALVE TIMING

Valve Timing Check—With .020" tappet clearance #1 intake valve opens with piston 15° or .094" before top dead center with vibration dampener mark "IN-OP.1-6/" at pointer on timing gear cover. Reset tappet clearance at .016" Cold.

LUBRICATION & COOLING

LUBRICATION: Crankcase Capacity—6 qts.

Normal Oil Pressure—40 lbs. at 25-30 MPH.

NOTE—Oil pump has new vacuum pump unit (for windshield wiper operation) built in pump cover.

Oil Filter—Fram type Std. Replace filter cartridge at 5000 mile intervals or more often if required by operating conditions.

COOLING: Capacity—13 qts. (14 with Climatizer).

NOTE—Water pump is new "packless" type similar to Champion type. No packing adjustment required.

Thermostat—In cylinder head outlet (by-pass between cylinder head and block permits re-circulation with thermostat closed). Thermostat starts to open at 151-155°F.

MECHANICAL

All specifications and adjustments for these units (Clutch, Overdrive, Front Suspension, and Brakes) are same as for Champion Model 6G except as noted in Champion article. See 1947 Studebaker Champion 6G article for data.

FRONT SUSPENSION SPECIFICATION TABLE

Car Models	Kingpin Inclination	Caster	Camber	Toe-In	Steering Geometry (Inner Wheel) ⑥
Buick 40, 50, 70.....	4 1/4" ①	3/8° (0-1 1/8°)	3/8° (7/8° Pos., 5/8° Neg.)	1/16" to 1/8"	
Cadillac (all).....	5° 51'	Neg. 1 3/4° to Neg. 2 3/4°	Neg. 3/8° to Pos. 3/8°	1/32" to 3/32"	③
Chevrolet Pass. Cars.....	4 3/4" ± 1/2"	0° ± 1/2°	Neg. 1/4° ± 1/2°	0" to 1/16"	24° ± 2°
Chrysler Six.....	4 3/4" to 6°	0° ± 1°	1/4° ④	0" to 1/16"	22°
Chrysler Eight.....	4 3/4" to 6°	0° ± 1°	1/4° ④	0" to 1/16"	21 1/2°
Crosley CC47.....	6 1/2°	10°	2°	3/64" to 1/16"	
De Soto.....	4 3/4" to 6°	0° ± 1°	1/4° ④	0" to 1/16"	22°
Dodge.....	4 3/4" to 6°	0° ± 1°	1/4° ④	0" to 1/16"	22°
Ford.....	8° ⑧	3°	3/4°	1/16"	
Frazer.....	5 1/2-6°	0° ± 1°	1/4° (0-3/4°)	1/16"	
Hudson.....	4° 36'	Neg. 1/4° to Pos. 1/4°	1/4° to 3/4°	0" to 1/16"	30° ± 1/2° ⑥
Jeep 1942-45.....	7 1/2°	3°	1 1/2°	3/64" to 3/32"	⑩
Kaiser.....	5 1/2-6°	0° ± 1°	1/4° (0-3/4°)	1/16"	
Lincoln.....	4°	3° to 5°	1/4° to 3/4°	1/16" to 1/8"	
Mercury.....	8°	4 1/2° to 9°	1/4° to 1°	1/16"	
Nash "600".....	7 1/2°	1/4°-3/4°	1/4-3/4°	1/8" to 3/16"	23 1/4°
Nash Amb. 6.....	4 1/2°	0° to Neg. 1/2°	1/4° to 3/4°	1/32" to 3/32"	21 1/2°
Oldsmobile.....	4° 51' 10"	0° to Neg. 3/4°	Neg. 1/4° to Pos. 3/4°	1/16" to 1/8"	23° ± 1/2°
Packard 2100, 1, 11.....	5° 35'	Neg. 1° ± 1/2°	0° ± 1/4°	0" ⑦	23° ± 1/2°
Packard 2103, 2106.....	5° 35'	Neg. 1° ± 1/2°	0° ± 1/4°	0" ⑦	23° ± 1/2°
Plymouth.....	4 3/4" to 6°	0° ± 1°	1/4° ④	0" to 1/16"	22°
Pontiac.....	5 1/2-6°	Neg. 3/4° ± 1/4°	0° ± 1/4°	0" to 1/16"	23 ± 1/2°
Studebaker 5G, 6G.....	5 1/2°	1 1/2°	1/2° ± 1/4°	1/16" to 1/8"	22 1/2-23°
Studebaker 14A.....	5 1/2°	1 1/2°	1/2° ± 1/4°	1/16" to 1/8"	
Willys Jeep CJ2A.....	7 1/2°	3°	1 1/2°	3/64" to 3/32"	⑨
Willys Sta. Wag. 4-63.....	5 1/2°	1°	1°	1/16" to 1/8"	

①—With 3/8° Camber.

③—Left Turn 25° 25', Right Turn 24° 42' (60S, 61, 62). Left Turn 24° 7', Right Turn 23° 6' (75 Pass. & Coml.).

④—Limits 0° to 3/4°.

⑤—On Hudson Models Outer wheel turned 25°. On all other cars, Outer Wheel turned exactly 20° except as noted.

⑦—Limits 0" to 1/16".

⑧—8 1/2" on Heavy Duty and Cab-Over-Engine Trucks.

⑨—Inner Wheel 20° with Outer Wheel turned 18° 30'.

⑩—Inner Wheel 20° with Outer Wheel turned 19° 45'.

All figures Positive unless specifically stated to be Negative.

1946 JEEP

HOOD LOCK (4-63): Hood lock button is located on instrument panel to right of central instrument cluster.

MODEL IDENTIFICATION

	Model	First Serial No.
Jeep (Civilian Model)	CJ-2A	10,001
Jeep Station Wagon	4-63	10,001
Jeep Sedan Delivery	4-63	10,001

SERIAL NUMBER: See model notation (above) for first Nos. Stamped on plate on right hand side of instrument panel (Jeep), on floor riser at left of drivers seat (Station Wagon & Sedan Delivery), and on plate on front end of left frame side rail.

ENGINE NUMBER: First No. U-10001 (Jeep). Stamped on water pump boss at front end of cylinder block.

TUNE-UP

COMPRESSION: Pressure—110 lbs. at cranking speed for Std. 6.48-1 Head.

VACUUM READING: Steady 21-23" idling at 8 MPH.

FIRING ORDER: 1-3-4-2.

SPARK PLUGS: Auto-Lite AN-7 or AN-7B. 14 mm. Metric type Gaps—.030".

IGNITION: See Coil, Condenser, and Distributor.

Breaker Gap—.020" Limits .020-.024".

Breaker Arm Spring Tension—17-20 ozs.

Rotation—Counter-clockwise viewed from above.

Cam Angle—41° closed (distr. degrees).

Automatic Advance—Starts at 250 RPM (Jeep), 350 RPM (Station Wagon & Sedan Delivery). Maximum advance 11° at 1500 RPM for all models (Distr. degrees & RPM).

Vacuum Advance (Station Wagon & Sedan Delivery)—Starts with 3½" vacuum. Maximum advance 10° distr. with 15" vacuum. **NOTE**—Not used on Jeep model.

IGNITION TIMING: Std. Setting—5° BTDC. **NOTE**—This setting correct for Jeep with 72 Octane Rating fuel. For 68 Octane Fuel, set Jeep at TDC.

Timing Mark—Flywheel mark "IGN" (5° BTDC. setting), "TC" (TDC setting) at center of inspection hole in right front face of flywheel housing.

CARBURETION: See Carburetion.

Idle Setting—Idle adjusting screw set for smooth idling with warm engine (screw 1-2 turns open—turn screw out for richer mixture). Idle speed 8 MPH. (Jeep), 600 RPM. or 6 MPH. (Station Wagon & Sedan Delivery).

Float Level (Jeep 596-S)—¾" from top of float at free end to gasket seat on bowl cover with valve seated (invert to check). **CAUTION**—Do not compress spring in valve stem (allow float to hang freely).

Float Level (Station Wagon & Sedan Delivery 613-S)—5/16" from top of projection on bowl cover to top of soldered seam on free end of float with valve seated (invert to check).

CAUTION—Do not compress spring in valve stem (allow float to hang freely).

Accelerating Pump—No seasonal adjustment.

Fuel Pump Pressure—4½ lbs. maximum.

MANIFOLD HEAT CONTROL: Automatic thermostatic type. No adjustment required. When installing assembly, see that thermostatic spring end rests on top of spring stop bracket on manifold.

CAUTION—Check valve for free operation when tuning up engine.

CRANKCASE VENTILATOR: Remove and clean Vacuum Control Valve on manifold. See *Crankcase Ventilator (following page)* for directions.

VALVES: See Valve Timing.

Tappet Clearance—.014" All Valves, Hot or Cold.

NOTE—Adjusting screws self-locking (no locknuts).

STARTING: See Battery, Starter, Generator, and Regulator.

IGNITION

COIL: Auto-Lite Model IG-4314 or 4314A (Jeep), IG-4090A (Sta. Wagon & Sedan Delivery). Coil on Jeep is lock-coil type mounted on back of instrument panel. Coil on Sta. Wagon & Sedan Delivery is mounted on right side of engine near distributor (separate switch).

Ignition Current—2.5 amperes idling, 5 stopped.

CONDENSER: Auto-Lite Part No. IGB-1025 (IGW-4177-1 & IGW-4189 Distr.), IGW-3139 (IAD-4068 Distr.).

Capacity—18-.26 microfarad (all models).

DISTRIBUTOR: Auto-Lite Model IGW-4177-1 or IAD-4068 (Jeep), IGW-4189 (Sta. Wagon & Sedan Delivery). Full automatic advance type. Model IGW-4189 has separate vacuum spark control unit linked to advance arm.

See *Tune-Up for distributor specifications.*

IGNITION TIMING: See *Tune-Up for settings.*

CARBURETION

CARBURETOR: Carter WO Model 596-S (Jeep), WA-1 Model 613-S (Station Wagon & Sedan Delivery). 1" (596-S), 1¼" (613-S), single barrel, downdraft type.

See *Tune-Up for carburetor adjustment directions.*

Metering Jets (596-S)—Std. Metering Rod No. 75-547. Checking Gauge No. T109-26 (2.718"). Std. Metering Rod Jet No. 120-151S (.070").

Metering Jets (613-S)—Std. Metering Rod No. 75-589. Checking Gauge No. T109-102 (2.468"). Std. Metering Rod Jet No. 120-67S (.098").

FAST IDLE: Setting—No adjustment required (linkage opens throttle to fast idle position when choke valve closed for starting).

AIR CLEANER (Jeep): Oakes Model 613300. Oil-bath type.

Servicing—Clean filter and refill with clean oil at 2000 mile intervals (at each engine oil change). Use same grade oil as used in crankcase. Capacity approximately 1¼ pints.

AIR CLEANER (Sta. Wagon & Sedan Delivery): Oakes Model 616615 Oil-wetted type Std., Model 616150 Oil-bath type Optl.

Servicing (Oil-wetted type)—Clean filter element and re-oil at 2000 mile intervals or more often if required by operating conditions.

Servicing (Oil-bath type)—See Jeep Air Cleaner.

FUEL PUMP: AC. Type AF. Diaphragm type. Pressure—3 lbs. (4½ lbs. max. at 1800 RPM).

ELECTRICAL

BATTERY: Auto-Lite (U. S. L.) Type PN-15. 6 volt, 15 plate, 100 ampere Hour capacity (20 hour rate).

Grounded Terminal—Negative (—) terminal.

Location—In engine compartment on right side.

STARTER: Auto-Lite Model MZ-4113 (Jeep), MZ-4137 (Station Wagon & Sedan Delivery).

Armature—No. MZ-2089 (MZ-4113), No. MZ-2214 (MZ-4137).

Drive—Special Barrel type Bendix No. A-2233 (MZ-4113), overrunning clutch and positive pinion shift actuated by starting pedal (MZ-4137).

Rotation—Counter-clockwise at commutator end.

Brush Spring Tension—42-53 ozs. (new brushes).

Cranking Engine—160 RPM, 150-175 amps., 5 volts.

Performance Data

Torque	RPM.	Volts	Amperes
0 ft. lbs.	4300	5.5	70
2.55 "	1325	5.0	200
7.65 "	220	4.0	400
11.8 "	Lock	4.0	560

GENERATOR: Auto-Lite GDZ-4817A. Armature GDZ-2006F. Two brush (shunt) type with voltage and current regulation. Ventilated by fan on drive pulley.

Maximum Charging Rate—35 amperes, 8.0 volts, 1900 RPM (Cold).

Cold Performance Data Hot

Amperes	Volts	R.P.M.	Amperes	Volts	R.P.M.
0	6.4	925	0	6.4	1000
8	6.75	1140	8	6.75	1235
16	7.15	1370	16	7.15	1460
24	7.5	1590	24	7.5	1730
35	8.0	1900	35	8.0	2250

Rotation—Counter-clockwise at commutator end.

Brush Spring Tension—35-53 ozs. (new brushes).

Field Current—1.60-1.78 amperes at 6 volts.

Belt Adjustment—1" belt deflection with thumb pressure midway between generator and fan pulleys.

REGULATOR: Auto-Lite Model VRP-4007-C2. Voltage-Current Type.

Relay Closes—6.4-7.0 volts (set to 6.4-6.6 volts).

Relay Opens—4.1-4.8 volts (approx. 4-6 amps. disch.)

Voltage Setting—7.2-7.5 volts at 70°F.

Current Setting—34-36 amperes.

Checking & Adjusting—See article in *Electrical Equipment Section on this type regulator.*

LIGHTING: Headlamps—Corcoran-Brown Sealed Beam.

Adjustment—Aim upper beam straight ahead (hot spot center 3" below lamp center height at 25').

Lamp Bulbs—See *Specification Table on Page 31.*

CONTINUED FROM PRECEDING PAGE

LIGHTING CIRCUIT BREAKER: Vibrating thermostatic type. Mounted on back of lighting switch. Protects lighting circuits by vibrating to limit current to 30 amperes.

ENGINE

ENGINE SPECIFICATIONS: Four Cylinder, "L" Head.
Bore— $3\frac{1}{8}$ ". Stroke— $4\frac{3}{8}$ ".

Displacement—134.2 cu. ins. Rated H.P.—15.63

Developed Horsepower—60 (Jeep), 63 (Sta. Wagon & Sedan Delivery) at 4000 RPM.

Compression Ratio—6.48-1 Std. Cast Iron Head.

PISTONS: Lynite, aluminum alloy, "T" slot, Cam ground (oval), tin-plated or brass-plated type.

Weight—12.5 ozs. (stripped). Length— $3\frac{3}{4}$ ".

Clearance—.004" (skirt). Use .003" feeler stock, $\frac{3}{4}$ " wide, to check clearance. Insert feeler between piston and cylinder wall on side opposite slot. Pull required to withdraw feeler should be 5-10 lbs.

Replacement Pistons—Finished pistons furnished .005", .015", .025", .035", .045" Oversize.

CAUTION—Pistons must not be "lapped" in (will destroy plated finish).

Installing Pistons—T slot toward valve (left) side of engine (opposite side from oil spray hole in lower end of connecting rod).

PISTON RINGS: Width End Gap Side Clearance
Compr. (#1,2) $3/32$ " ① .008-.003".....0005-.001"
Oil Cont. (#3) $3/16$ " ② .008-.013".....001-.0015"
①—.0925-.0935" ②—.1860-.1865"

Installing Rings—Mark "TOP" on compression rings must be upward (rings have taper face) and bevel on inner edge of top ring must also be upward.

Replacement Rings—Furnished .005", .015", .025", .035", .045" Oversize.

PISTON PIN—Locked in connecting rod by clamp-screw.

Clearance—.0001-.0009" in piston or light thumb push fit with piston and rod at 70°F.

CONNECTING ROD BEARINGS: Removable, steel-backed, babbitt-lined type. **CAUTION**—When installing upper bearing, line up oil spray hole with hole in rod.

Clearance—.0005-.0025". Sideplay .005-.009".

NOTE—Palnuts used on connecting rod bolts. To install after regular bolt nut tightened to 50-55 ft.lbs., turn Pálnut up against regular nut (flat face in), then tighten Pálnut $\frac{1}{2}$ turn additional.

Replacement Bearings—Std. size and .010", .020", .030" Undersize.

Installing Rods—Lower bearings offset. Install rods with widest half of bearing away from nearest main bearing or toward front of engine (#2, 4), toward rear (#1, 3). Oil spray hole in lower end of rod must be toward right side (away from camshaft) on all rods.

CRANKSHAFT BEARINGS: Removable, steel-backed, babbitt-lined type. Bearing shells are dowelled in bearing caps and crankcase.

Clearance—.001-.0025" (replace when more than .006").

Endplay—.004-.006" (taken by front bearing). Replace bearing when endplay exceed .018".
Replacement Bearings—Std. size and .010", .020", .030" Undersize.

CAMSHAFT SETTING (Jeep): Mesh chain with #1 piston on top dead center and sprockets turned so that marks are adjacent and in line with straight-edge across shaft centers.

CAMSHAFT SETTING (Sta. Wagon & Sedan Delivery): Mesh gears with marked teeth together (gear drive—no timing chain used).

VALVES: Head Diam. Seat Angle Stem Clearance
Intake $1\frac{17}{32}$ " 45°0015-.00325"
Exhaust $1\frac{15}{32}$ " 45°002-.00375"
Valve Spring Pressure—50 lbs. at $2\frac{7}{64}$ " (closed), 116 lbs. at $1\frac{3}{4}$ " (open). Spring free length $2\frac{1}{2}$ ".

VALVE TIMING

Valve Timing Check—Set tappet clearance #1 intake valve at .020". This valve should open with piston 9° or .039" before top dead center with flywheel mark "I.O." at center of inspection hole on right front face of housing. Reset tappet clearance at .014" running clearance with engine Cold or Hot.

LUBRICATION & COOLING

LUBRICATION: Crankcase Capacity—4 qts. (refill).
Normal Oil Pressure (Jeep)—50 lbs. (gauge), 25 lbs. (actual) at 30 MPH.

Normal Oil Pressure (Sta. Wagon & Sedan Delivery)—35 lbs. at 30 MPH. **NOTE**—Oil pump on these models is new rotor type. This pump has oil pressure regulator built in pump body (regulator on pump cover on Jeep model).

Oil Filter (Jeep)—Mounted on bracket on right front corner of cylinder head with outlet tube connected to timing chain cover. Filter should be drained at each crankcase oil change (add 1 qt. oil additional in crankcase to make up for filter capacity), and filter elements replaced at 8000 mile intervals for normal service.

Oil Filter (Sta. Wagon & Sedan Delivery)—Puro-lator type Optl.

COOLING: Capacity—11 qts. **NOTE**—Special "Hot Climate Radiator" Optl. on Jeep model.

Pressure Valve—In radiator filler cap. Opens at $3\frac{1}{4}$ - $4\frac{1}{4}$ lbs.

Thermostat—In outlet elbow on cylinder head. Starts to open at 148-155°F. Fully open at 173°F.

CRANKCASE VENTILATOR

Sealed, Positive Ventilation Type. Consists of an air intake pipe from the Air Cleaner to the Crankcase Oil Filler (Oil Filler has gasket and must seat tightly to prevent air leaks at this point) and an air outlet pipe from the Valve Chamber Cover to the Intake Manifold. There is a Vacuum Valve at the manifold connection and this valve must close at idling speed for satisfactory engine idling performance.

Servicing—Make certain that connecting pipes are tight and that oil filler cap gasket seals filler cap tightly. Remove and clean control valve when tuning engine or whenever system does not operate satisfactorily.

Vacuum Control Valve—Remove control valve (disconnect pipe, unscrew valve assembly from manifold), clamp valve in vise and remove top, remove valve and spring, clean valve and valve seat thoroughly, reassemble and re-install unit.

MECHANICAL

CLUTCH: Atwood (Auburn) Single plate, dry disc type with Borg & Beck driven member.

Pedal Adjustment (Jeep)—Free travel $\frac{3}{4}$ ". To adjust, loosen locknut on clutch fork connecting cable clevis at cross-shaft connection, screw cable end out of clevis, tighten locknut.

Pedal Adjustment (Sta. Wagon & Sedan Delivery)—Free travel 1". To adjust, loosen locknut on connecting link at clutch fork, turn adjusting nut on link, tighten locknut.

Facings—Molded (flywheel side), Woven (pressure plate side). I.D. $5\frac{1}{2}$ ". O.D. $8\frac{1}{2}$ ". Thickness .135".

OVERDRIVE (Sta. Wagon & Sedan Delivery): Warner type used with new Warner T96 Transmission Optl. Overdrive is new governor controlled type (no centrifugal pawls) with electrical solenoid operated engagement and disengagement and throttle controlled "kick-down."

FRONT SUSPENSION (Jeep): Spicer Model 25 special full-floating driving unit. Springs are semi-elliptic type.

See Front Suspension Specification Table on Page 38.

FRONT SUSPENSION (Sta. Wagon & Sedan Delivery): Planar type independent suspension with transverse spring.

See Front Suspension Specification Table on Page 38.

BRAKES (Jeep): Service—Bendix (Lockheed) Four-wheel, Hydraulic, double anchor type. Hand brake is independent type (see below).

Clearance—.008" toe, .005" heel, for each shoe.

Drum Diameter—9".

Lining—Width $1\frac{3}{4}$ ". Thickness .206-.216". Length per shoe $10\frac{7}{32}$ " (forward shoes), $6\frac{39}{64}$ " (rear shoes). **NOTE**—Manufacturer recommends use of new or replacement shoe assemblies with factory-installed lining.

Hand Brake: Independent, mechanical, internal expanding two-shoe type with drum mounted on shaft at rear of transfer case.

Adjustment—Back off each adjusting screw exactly 7 notches from point where shoe is snug against drum.

Drum Diameter—8".

Lining—Woven type. Width $1\frac{3}{4}$ ". Thickness .206-.216". Length per shoe $8\frac{1}{8}$ ".

BRAKES (Sta. Wagon & Sedan Delivery): Bendix (Lockheed) Hydraulic type. Brakes are new type with self-centralizing (floating) shoes and do not have anchor pin adjustment. Hand lever applies rear wheel service brakes.

Clearance—Adjusting cam for each shoe backed off from point where shoes are tight against drum until wheel turns freely without drag. **CAUTION**—Before adjusting brakes, centralize shoes by applying brakes firmly and then releasing pedal.

Drum Diameter—9.948".

Lining—Moulded type (all shoes). Width 1.760". Thickness .222". Length per wheel 19".